



GRADUATE CATALOG

Old Dominion UNIVERSITY



2009-2010

**OLD
DOMINION
UNIVERSITY
GRADUATE
CATALOG**

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NATURE OF ANNOUNCEMENTS. Announcements contained in this publication are subject to change without notice and may not be regarded in the nature of binding obligations to the University. The University reserves the right to change any provisions or requirements. Only the Provost or designee can approve changes to the Catalog except where otherwise stated within.

When students matriculate with Old Dominion University, they come under the academic requirements of the edition of the Catalog at that time. Students may graduate under these academic requirements within a period of six years even though subsequent Catalogs may change. Academic requirements include competency requirements, general education requirements, grade point average requirements, major and minor course requirements, foreign language requirements, overall unit requirements and related curriculum matters. Grading practices, tuition, fees and other matters are not considered to be “academic requirements” and are subject to change at the discretion of the University.

Should new changes be to their advantage, undergraduate students may graduate under the conditions of the newer catalog. However, because academic programs are subject to requirements imposed by outside accrediting or certifying agencies, the Commonwealth of Virginia, and the United States of America, such outside requirements take precedence.

Old Dominion University is committed to policies that assure that there is no discrimination on the basis of age, sex, race, color, religion, national origin, veteran status, political affiliation, handicap, or sexual orientation. Old Dominion University complies with the Family Rights and Privacy Act of 1974 (as amended).

The University is an Affirmative Action Equal Opportunity employer.

STUDENT RESPONSIBILITY FOR CATALOG INFORMATION. Students are held individually responsible for the information contained in the University Catalog. Failure to read and comply with University regulations will not exempt students from whatever penalties they may incur.

II OLD DOMINION UNIVERSITY

Academic Calendar

First Semester 2009-10

August 29 (Saturday)	Classes begin
September 7 (Monday)	Labor Day Holiday
October 10-13 (Sat-Tues)	Fall Holiday
November 10 (Tuesday)	Last day to withdraw from classes
November 25-29 (Wed-Sun)	Thanksgiving Holiday
December 11 (Friday)	Classes end
December 12 (Saturday)	Exams begin
December 18 (Friday)	Exams end
December 19 (Saturday)	Commencement

Second Semester 2009-10

January 9 (Saturday)	Classes begin
January 16-18 (Sat-Mon)	Martin Luther King, Jr. Holiday
March 8-13 (Mon-Sat)	Spring Holiday
March 30 (Tuesday)	Last day to withdraw from classes
April 4 (Sunday)	Easter – no classes held
April 27 (Tuesday)	Classes end
April 28 (Wednesday)	Reading Day
April 29 (Thursday)	Exams begin
May 6 (Thursday)	Exams end
May 8 (Saturday)	Commencement

Summer 2010

May 10 (Monday)	Session 1 & 3 classes begin
May 17 (Monday)	Session 2 classes begin
May 31 (Monday)	Holiday – no classes held
June 1 (Tuesday)	Session 4 classes begin
June 27 (Sunday)	Session 1, 2, & 4 classes end
June 28 (Monday)	Session 5, 6, & 7 classes begin
July 5 (Monday)	Holiday – no classes held
July 25 (Sunday)	Session 7 classes end
August 8 (Sunday)	Session 6 classes end
August 15 (Sunday)	Session 5 classes end

First Semester 2010-11

August 28 (Saturday)	Classes begin
September 6 (Monday)	Labor Day Holiday
October 9-12 (Sat-Tues)	Fall Holiday
November 9 (Tuesday)	Last day to withdraw from classes
November 24-28 (Wed-Sun)	Thanksgiving Holiday
December 10 (Friday)	Classes end
December 11 (Saturday)	Exams begin
December 17 (Friday)	Exams end
December 18 (Saturday)	Commencement

Second Semester 2010-11

January 8 (Saturday)	Classes begin
January 15-17 (Sat-Mon)	Martin Luther King, Jr. Holiday
March 7-12 (Mon-Sat)	Spring Holiday
March 29 (Tuesday)	Last day to withdraw from classes
April 26 (Tuesday)	Classes end
April 27 (Wednesday)	Reading Day
April 28 (Thursday)	Exams begin
May 5 (Thursday)	Exams end
May 7 (Saturday)	Commencement

Summer 2011

May 9 (Monday)	Session 1 & 3 classes begin
May 16 (Monday)	Session 2 classes begin
May 30 (Monday)	Holiday – no classes held
May 31 (Tuesday)	Session 4 classes begin
June 26 (Sunday)	Session 1, 2, & 4 classes end
June 27 (Monday)	Session 5, 6, & 7 classes begin
July 4 (Monday)	Holiday – no classes held
July 24 (Sunday)	Session 7 classes end
August 7 (Sunday)	Session 6 classes end
August 14 (Sunday)	Session 5 classes end

First Semester 2011-12

August 27 (Saturday)	Classes begin
September 5 (Monday)	Labor Day Holiday
October 8-11 (Sat-Tues)	Fall Holiday
November 8 (Tuesday)	Last day to withdraw from classes
November 23-27 (Wed-Sun)	Thanksgiving Holiday
December 9 (Friday)	Classes end
December 10 (Saturday)	Exams begin
December 16 (Friday)	Exams end
December 17 (Saturday)	Commencement

Second Semester 2011-12

January 7 (Saturday)	Classes begin
January 14-16 (Sat-Mon)	Martin Luther King, Jr. Holiday
March 5-10 (Mon-Sat)	Spring Holiday
March 27 (Tuesday)	Last day to withdraw from classes
April 24 (Tuesday)	Classes end
April 25 (Wednesday)	Reading Day
April 26 (Thursday)	Exams begin
May 3 (Thursday)	Exams end
May 5 (Saturday)	Commencement

Summer 2012

May 7 (Monday)	Session 1 & 3 classes begin
May 14 (Monday)	Session 2 classes begin
May 28 (Monday)	Holiday – no classes held
May 29 (Tuesday)	Session 4 classes begin
June 23 (Saturday)	Session 1, 2, & 4 classes end
June 25 (Monday)	Session 5, 6, & 7 classes begin
July 4 (Wednesday)	Holiday – no classes held
July 21 (Saturday)	Session 7 classes end
August 4 (Saturday)	Session 6 classes end
August 11 (Saturday)	Session 5 classes end

Letter from the Vice Provost

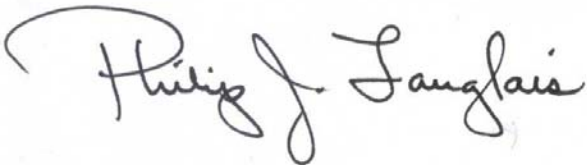
Old Dominion University is undergoing a transformational rise in the quality of our programs. Our vision is to train the future leaders, professionals and societal shakers for a very different and dynamic 21st century world. The demand for quality and meaningful education in higher education has reached new heights and this demand is most critical in graduate education. ODU is responding to these demands by offering certificate, licensure, masters and doctoral programs that enhance not only knowledge but the skills and real-life experiences you need to solve problems, to think creatively and critically, to work with diverse teams, and to communicate effectively to a multidisciplinary and international audience.

In the information that follows, you will see that ODU offers a wide range of dynamic graduate programs in our colleges of Arts and Letters, Business and Public Administration, Education, Engineering and Technology, Health Sciences and Sciences. Our graduate students enjoy many opportunities to work on interdisciplinary, collaborative research projects with faculty who are recognized nationally and internationally for their innovative teaching and ground breaking research. Many of our graduates have distinguished themselves in academic as well as in public and private venues. We take pride in our tradition of excellence and success in nurturing future scholars and professionals.

The Office of Graduate Studies staff and the ODU faculty welcome the opportunity to discuss with you how our programs may accommodate your interests.

Best wishes for your success!

Sincerely,

A handwritten signature in black ink that reads "Philip J. Langlais". The signature is written in a cursive style with a large, looping initial "P".

Philip J. Langlais
Vice Provost for Graduate Studies and Research

Old Dominion University

History

Old Dominion University began its tradition of excellence when it was founded in 1930 by the College of William and Mary, the second oldest university in the United States. Established as an extension of William and Mary in Williamsburg, Virginia, and Virginia Polytechnic Institute in Blacksburg, Virginia, Old Dominion began educating teachers and engineers. The two-year school rapidly evolved into a four-year institution, and was granted independence in 1962 as Old Dominion College.

Considerable growth in enrollment, the expansion of research facilities and preparation for the addition of graduate programs led the Board of Visitors to approve the name change to Old Dominion University. Now Old Dominion is a powerhouse for higher education with six colleges: Arts and Letters, Business and Public Administration, Education, Engineering and Technology, Health Sciences and Sciences. Old Dominion has offered master's degrees since 1964 and Ph.D.s since 1971. Students currently choose from 70 baccalaureate programs, 59 master's programs, two education specialist programs and 41 doctoral programs. The University has achieved designation as a Research University (high research activity) from the Carnegie Foundation for the Advancement of Teaching.

Proud of its past, Old Dominion constantly looks to the future and prides itself on its continually expanding research and teaching programs. An ever-evolving university, Old Dominion is an agent of change for its students, for the region and the nation it serves. Old Dominion is Virginia's forward-focused, public doctoral research university for students from around the world who want a rigorous academic experience in a profoundly multicultural community. Our nationally recognized faculty use real-world expertise and innovative teaching methods to challenge students to achieve their highest goals. Our determined entrepreneurial approach to problem-solving drives cutting-edge research, eminent scholarship and strategic partnerships with government, business, industry, organizations and the arts.

Students

The students at Old Dominion share a special sense of excitement derived in part from the rich tapestry of backgrounds, cultures and ages represented here. Our students hail from all 50 states and more than 100 countries. Studying in this multicultural, international environment, and taking advantage of our guaranteed internship program, offers students a true edge after they graduate and begin to compete for jobs in the "real world."

Among ODU's outstanding students in recent years are a Rhodes Scholar, Truman Scholar and three USA Today Academic All-Americans, as well as the first undergraduate in the commonwealth of Virginia to earn a patent. The University's alumni ranks include an Emmy Award-winning television producer, a United States Air Force astronaut, the former Vice Chief of Naval Operations, the commander, U.S. Central Command, the former chief of surgery at Walter Reed Army Medical Center, award-winning authors, engineers and scientists, and professional coaches and athletes.

More than 16,000 undergraduates and 6,000 graduate students comprise the Old Dominion student body. Residence halls and apartments on campus house more than 3,800 students, while many other students live nearby within walking distance of the campus. Another 6,000 are distance learners located throughout Virginia and other states - even on ships at sea - who rarely ever set foot on the campus. A significant percentage of students are in some way connected to the military.

Students in search of extracurricular activities don't have far to look. The University boasts more than 200 student clubs and organizations. The Office of Student Activities and Leadership (OSAL) sponsors a wide variety of programs that complement academic excellence, offer a supportive environment, engage students in various learning experiences and provide them with opportunities to interact with a diversity of groups and individuals. OSAL is primarily responsible for commuter services, clubs and organizations, Greek-letter organizations, leadership programs, service and volunteerism, and weekend activities.

The Norfolk Campus and Region

Situated on 188 acres near downtown Norfolk, Old Dominion University's main campus stretches from the Elizabeth River to the Lafayette River, and watching sunsets on the water is a natural pastime for our students. With its garden areas, reflecting pools and spacious green lawns bordered by tree-lined walkways, the campus offers the best of both worlds - a beautiful setting and just minutes away from Hampton Roads' largest cities.

One of the most exciting developments on the campus today is the University Village, with its impressive centerpiece, the Ted Constant Convocation Center, which opened its doors in 2002 and hosts everything from basketball games to concerts to commencements. This 75-acre development at the east end of campus is home to 960 modern student apartments, a variety of restaurants and shops, a hotel, research facilities, an art gallery, and bookstore.

On the main campus, at the west end of the grassy, five-acre Kaufman Mall, lies Webb University Center, a spacious facility that dazzles with its two-story glass facade, creating an outdoor ambience and providing a sunny home - in any season - for student life. At the north end of campus, stroll along the brick sidewalks of the Williamsburg Lawn, with its towering willow oak trees, offers students and visitors a trip back in time to the beginnings of the University.

Old Dominion's 75th anniversary in 2005 found an impressive array of cutting-edge facilities that have created a campus that's ideal for the pursuit of a diverse number of majors. Among these are the fully automated Perry Library, with more than 3.2 million items, state-of-the-art laboratories in the sciences and engineering, and the new E.V. Williams Engineering and Computational Sciences Building. The campus is also home to Pretlow Planetarium, the Lions Child Study Center, new, superior facilities for clinical work in the health sciences, a modern Oceanography and Physics Building, the Gornito TELETECHNET Center and the Diehn Fine and Performing Arts Center. Recent additions include an orchid conservatory and research building, as well as renovation to the Technology Building and the Batten Arts and Letters Building, all of which will further provide expanded opportunities for our students in the arts, sciences, health sciences and engineering. The campus boasts a variety of indoor and outdoor sports facilities. A completely new student recreational center opened in 2009.

Further enhancing the on-campus engineering and science curricula, the University operates the Mid-Atlantic Regional Spaceport located at Wallops Island on Virginia's Eastern Shore and the Langley Full Scale Tunnel in Hampton; has a significant presence in the Applied Research Center at the Department of Energy's Jefferson Laboratories in Newport News; continues to expand its Reidy Research Center for Bioelectrics in Norfolk and the Virginia Modeling, Analysis, and Simulation Center on the Portsmouth-Suffolk border; and owns and manages the Blackwater Ecological Preserve in Zuni.

Only 20 miles from the sand and surf of Virginia Beach and just 40 miles from historic Williamsburg, ODU's Norfolk campus, in one of the nation's oldest seaports and one of today's busiest international seaports on the east coast, offers an attractive location for study and leisure. Prospective students and families are welcome to visit the campus Monday through Saturday throughout the year.

Faculty

Approximately 730 full-time and 650 part-time faculty bring a wealth of talent to our classrooms each day. Their lively, provocative teaching, research and applied experience, along with their commitment to academic excellence, combine to make the Old Dominion experience a rewarding one for students.

Many of our faculty have been recognized on the state and national levels with awards for teaching, research and service. Since 1990, Old Dominion University faculty have won three professor of the year awards from the Carnegie Institute for the Advancement of Teaching, one Humboldt Award, three Virginia Outstanding Scientist awards sponsored by the Science Museum of Virginia, and 24 Virginia Outstanding Faculty Awards that are sponsored by the State Council of Higher Education for Virginia. Among our faculty ranks you will find nationally and internationally recognized scientists, engineers, educators and authors.

Faculty also serve as the primary academic advisers to our students, beginning in the freshman year. These relationships offer a special opportunity for new students to understand their chosen majors from the perspective of extensive experience and insight that only a professor can offer.

Because of our location and our relationship with dozens of corporations, federal facilities, the armed services, health care services and the tourist industry, faculty at Old Dominion bring a real-world, problem-solving focus to the classroom that makes learning come to life.

A Global Vision

Old Dominion University has made an extraordinary commitment to be recognized as a globally focused institution. This commitment is reflected in a series of recent innovations including:

- International Student Leadership Awards for outstanding leadership and academic achievement to Old Dominion's diverse international student community
 - Provost Award for Leadership in International Education, recognizing faculty leadership in program innovation
 - Dean's Education Abroad Awards, expanding financial support to bring study abroad within reach for more undergraduates
 - ICAP, adding a global dimension to the University's innovative Career Advantage Program
 - The Office of International Programs, a comprehensive support office that facilitates continued global exploration and innovation
- For more information visit www.odu.edu/oduhome/international.shtml.

Outside the Classroom

Clubs and organizations for nearly every interest—more than 200 in all—thrive at Old Dominion, nurturing the personal and social development that is essential to the University experience. Clubs for every college and most majors, sororities and fraternities, an Honor Council, Student Government, Student Activities Council, and numerous recreational sports teams and athletic clubs make it easy to get involved at Old Dominion. In addition, ROTC programs are available for the Navy, Army and Marine Corps.

The benefits and rewards of joining one or more student organizations vary depending on you! Some of the best reasons for getting involved are making new friends, leadership development, taking advantage of opportunities, exploring careers and gaining that Monarch Pride!

Eighteen NCAA Division I sports bring pride and spirit to campus life each year, including Division I-AA football to begin in 2009 and Old Dominion Monarchs have won 32 team and individual national titles, including four in basketball, nine in field hockey and 15 in sailing.

The Mission of the University

BACKGROUND

Old Dominion University is located in Hampton Roads, one of the world's major seaports. Since the early seventeenth century, Hampton Roads has been the state's gateway to the rest of the world and the world's gateway to Virginia in commerce and industry, in recreation and culture, and in national security. Now a complex of seven major cities, it is a microcosm of the opportunities and challenges of contemporary urban America. It is also a major center for research and development and a home for extensive scientific and technological activities in marine science, aerospace, ship design and construction, advanced electronics, and nuclear physics.

The University takes its unique character from Hampton Roads as it provides leadership to the state and nation in teaching, research, and service. Thus the University has a special mission for the Commonwealth in commerce, and in international affairs and cultures. It has a significant commitment in science, engineering and technology, particularly in fields of major importance to the region. As a metropolitan institution, the University places particular emphasis upon urban issues, including education and health care, and upon fine and performing arts.

As one of America's major ports, Hampton Roads is the locus of national and international military commands, and the home of a culturally diverse population. The University therefore has natural strengths in activities having international outreach. Faculty members in such fields as business, economics, international studies, geography and the sciences strive to design curricula, teach courses, and encourage foreign exchanges that enhance the University's role as Virginia's international institution.

The Hampton Roads scientific environment provides special opportunities for science and engineering faculty to emphasize research and graduate programs in such fields as marine science, aerospace, and advanced electronics. Global ocean studies and cooperative research at NASA receive particular attention, as University researchers collaborate with U.S. and foreign engineers and scientists.

Urban issues are addressed by programs in public administration, education, the social sciences, and the health professions. The richness of Hampton Roads' artistic life gives great vitality to the University's programs in the visual arts, music, theatre, and dance.

MISSION

Old Dominion University promotes the advancement of knowledge and the pursuit of truth locally, nationally, and internationally. It develops in students a respect for the dignity and worth of the individual, a capacity for critical reasoning and a genuine desire for learning. It fosters the extension of the boundaries of knowledge through research and scholarship and is committed to the preservation and dissemination of a rich cultural heritage. Old Dominion University is old enough to value tradition yet young enough to facilitate change. In a spirit of creative experimentation, innovation, research, and technology, the University is ready to meet the challenges of the twenty-first century.

MISSION SUPPORT

Old Dominion University serves the needs of several internal and external constituents with its resources. These include: current and prospective students seeking undergraduate, graduate, and continuing education programs; business and industry; government agencies at all levels; the military; research organizations; and the community at large regionally statewide, nationally, and internationally. These constituencies are discussed in greater detail in the following paragraphs.

Old Dominion University offers a wide array of undergraduate programs, all of which meet national standards of excellence. Every Old Dominion undergraduate student follows a general education program that is designed to develop the intellectual skills of critical thinking and problem solving and to encompass the breadth of understanding needed for personal growth and achievement and for responsible citizenship. This general education program places special emphasis upon appreciation of the arts and upon understanding the perspectives of women, minorities, and non-Western cultures. Each undergraduate chooses a major program in the liberal arts or sciences or in a technological or professional field.

Old Dominion University's graduate offerings are focused on society's need for advanced professional education and on specialized programs at the master's and doctoral levels for which the institution is prepared through unusual strength of faculty or special geographic advantages. All graduate programs meet national standards of excellence.

As a national leader in the field of technology-delivered distance learning, the University strives to enhance the quality of the educational experience, wherever education is delivered, by applying emerging technologies. It also supports research to explore the impact of these technologies on the teaching-learning process. By utilizing these technologies and by partnering with institutions of higher education, corporations, and governmental entities, the University is able to provide undergraduate and graduate degree programs to students across time and geographic boundaries.

Because of its commitment to Hampton Roads and its emphasis on creative innovation, Old Dominion University offers life-long learning opportunities through credit and noncredit courses and brings educational services and programs to the people of Hampton Roads at several off-campus centers. The University has a responsibility to serve the many members of the military services and their families. The military forms a unique combination of national and international constituents because they are from other locales in the United States and are looking to become, among other things, internationally capable in an international environment.

As a center of learning, Old Dominion University is committed to the principle of free inquiry. The University faculty of distinguished teacher-scholars seek to pass on the best in academic tradition while establishing themselves at the forefront of discovery and creativity. As partners in the development of the University's future, the faculty enjoy full academic freedom and have a recognized role in the decision-making process of the University. Mindful of present and future needs for a multicultural academic climate, the University deems recruitment and retention of minority and women faculty members and staff to be essential.

The University is committed to providing the highest quality instruction to all of its students. Teaching excellence is encouraged through faculty development programs and appropriate recognition of superior instruction.

The discovery of new knowledge through research and creative endeavor is a central function of Old Dominion University, which values and supports faculty participation in the discovery, synthesis, application and creation of new knowledge and art forms. The institution shall promote and preserve excellence in basic and applied research as a Carnegie Foundation Doctoral Research-Extensive University which is a key production and coordination force in technology development.

The University encourages the involvement of its faculty and staff in community service. The enrichment of the lives of students and residents of Hampton Roads is fostered through University sponsored cultural activities, fine and performing arts events, and intercollegiate athletics. In addition,

through applied research, consulting, and other activities, the University plays a prominent role in the development of local business and industry and serves as a resource of government agencies and both public and private educational institutions.

The University seeks in its student body a diversity of age, gender, ethnic, religious, social, and national backgrounds. It actively recruits American minority students along with students from other countries worldwide in such numbers as to have their presence make a discernible impact upon the University's educational processes. Old Dominion recognizes its mandate to serve both the academically gifted and those who have the potential for academic success despite educational, social, or economic disadvantages.

Extracurricular activities and experiences are offered that challenge students to develop a personal system of values, to think and act autonomously, to achieve physical competence, and to establish a sense of their own identity. Other services help students meet educational, personal, and health needs.

Old Dominion University depends on its alumni for advice, leadership, and support. In close collaboration with the University, the Alumni Association provides to former students opportunities to continue their participation in various aspects of university life, to advance their personal and professional development, and to sustain communication and strengthen bonds with their alma mater and fellow alumni.

To evaluate its accomplishments against its goals, a continuing process of systematic assessment is given high priority by the University. Information gained from such efforts is utilized to ensure the highest possible quality for all University programs. The Board of Visitors will conduct a periodic review of the University's mission and major goals in conjunction with representatives of the major University constituencies. The review will ensure that the mission clearly identifies the University's unique role in Virginia's public higher education system and assures that the University is focusing its resources to be the best that it can be in that role to achieve its mission and accomplish the major goals.

Adopted by the Board of Visitors
June 10, 1971
Revised January 17, 1989
Revised April 15, 1999
Revised June 14, 2002

Major Goals of the University

1. **Students.**
Old Dominion University is a selective admission institution. The University strives to serve those students in the immediate geographical area as well as attract students from the national and international communities. Additionally, the University seeks to attract and serve a culturally and ethnically diverse student body. The University pays particular attention to identifying and admitting students who are academically gifted. As a major metropolitan university, Old Dominion University has a special commitment to serve those students who have been academically, socially, or economically disadvantaged, but who have the potential for academic success.
2. **Faculty.**
Old Dominion University seeks to attract and retain a distinguished faculty of teacher-scholars. Its faculty enjoy academic freedom and have a recognized role in the decision-making process of the University. The University is committed to strengthening its faculty through the recruitment and retention of minorities and women.
3. **Academic Programs.**
UNDERGRADUATE PROGRAMS. As a comprehensive university, Old Dominion University offers and develops quality liberal arts, science, technology and professional programs. Old Dominion University undergraduate students follow a general education program that emphasizes intellectual skills and the breadth of intercultural understanding necessary for personal growth and achievement and responsible citizenship. All Old Dominion University degree programs meet national standards of excellence.
GRADUATE PROGRAMS. Old Dominion University's graduate offerings are focused on society's need for advanced professional education and on specialized programs at the master's and doctoral levels for which the institution is prepared through unusual strength of faculty or special geographic advantages. In selected graduate programs, the University aspires to international leadership.
SPECIAL EMPHASIS AREAS. Because Hampton Roads is a major international maritime and commerce center that is Virginia's window to the nation and world, the University has a special mission for the Commonwealth in commerce, and in international

affairs and cultures. With the principal marine and aerospace activities of the Commonwealth concentrated in Hampton Roads, the University has a significant commitment to science, engineering and technology, specifically in marine science, aerospace and other fields of major importance to the region. Due to its location in a large metropolitan area, Old Dominion University places particular emphasis on urban issues, including education and health care, and on fine and performing arts.

4. **Teaching.**
Old Dominion University is committed to providing the highest quality instruction to all of its students. Teaching excellence is encouraged through faculty development programs and appropriate recognition of superior instruction.
5. **Research, Scholarship and Creativity.**
Old Dominion University is a center of learning committed to the principle of free inquiry. The University seeks to participate in the acquisition, discovery, synthesis, application, and creation of new knowledge and art forms through research, scholarly endeavor and creative undertakings by faculty and students. In selected areas of research, scholarship and creativity, the University strives for international recognition.
6. **Distance Learning.**
As a national leader in the field of technology-delivered distance learning, Old Dominion University is committed to providing academic programs to a diverse national and international population. The University seeks partnerships and alliances that will facilitate delivering those programs to place-bound students.
7. **Life-long Learning.**
Old Dominion University is committed to the concept of life-long learning, and offers credit and noncredit courses throughout the region. The University seeks to develop off-campus centers to bring educational services and programs to the citizens of the region. Because of the major Armed Forces presence in Hampton Roads, the University is particularly cognizant of its responsibility to serve members of the military services and their families.
8. **Community Service.**
Community service is an important part of the University's mission. Particular importance is attached to the enrichment of the lives of students and residents of Hampton Roads through University cultural activities, fine and performing arts events, and recreational, intramural and intercollegiate athletics. The University acts as a resource to business, industrial, health care and educational organizations, as well as to the agencies of local, state and federal government. The University is committed through applied research, consulting and other activities to playing a major role in advancing the overall development of Hampton Roads.
9. **Student Life.**
The University provides opportunities for student development outside of the classroom. Programs are offered to enhance personal and social growth of individual students, to provide an exciting and stimulating collegiate environment and to enable students to cope with educational, career, and health needs. Students choosing to live in on-campus housing benefit from programs especially designed to promote student educational and personal development.
10. **Alumni.**
Alumni are an important part of the University community. Through outreach programs, participation on advisory committees, and a variety of professional and social activities, the University maintains a close relationship with its alumni and seeks alumni involvement and support for planning and development purposes.
11. **Quality.**
Improvement of the University is a continual process. The foregoing goals provide criteria for the rigorous and regular evaluation of the quality, pertinence and effectiveness of academic and other University programs. These goals also provide criteria for the assessment of student achievement and the performance of members of the faculty, administration, and staff.
Adopted by the Board of Visitors
January 17, 1989
Revised April 15, 1999

General Statement of Policy

Within the limits of the University's facilities as to numbers that can be accommodated, admission to Old Dominion University is open to all qualified students without regard to race, color, religion, national origin, sex, age, veteran

status, handicap, political affiliation, or sexual orientation; the facilities and services of the University are open to all enrolled students on those same bases, and all policies and standards of the University, including those governing employment, are applied accordingly. Students having concerns of this nature should contact the assistant to the president for affirmative action.

Inclusiveness Statement

The Office of Graduate Studies is proud to be a community of scholars dedicated to the principles of equity, inclusion and diversity. Our first priority is the provision of the richest and most effective educational experience possible. We recognize the unique contribution of each person engaged in graduate study at Old Dominion University and encourage applications from individuals reflective of underrepresented and underserved populations.

In particular, we embrace the principles that:

1. A diverse graduate student body and faculty best serves the interests of higher education and our nation;
2. A diverse student body and faculty enhances the respect for diverse opinions and intellectual exploration, regardless of the source of that new knowledge;
3. Our graduates will work and thrive in a diverse environment; fostering that inclusiveness in graduate education promotes the ultimate success.

The ODU Office of Graduate Studies subscribes to the principles of diversity and inclusiveness enunciated by the Council of Graduate Schools, <http://www.cgsnet.org>.

Accreditations

Old Dominion University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award baccalaureate, master's, education specialist, and doctoral degrees.

Numerous programs of study at the University are accredited by specialized accrediting agencies that are recognized by the Council on Higher Education Accreditation (CHEA).

The baccalaureate degrees in civil engineering, computer engineering, electrical engineering, environmental engineering, and mechanical engineering are accredited as engineering programs by ABET, Inc. The engineering technology programs in civil engineering technology, electrical engineering technology, and mechanical engineering technology are accredited as engineering technology programs by ABET, Inc.

The graduate and undergraduate teacher education degree programs in the Colleges of Arts and Letters, Education and Sciences are accredited by the National Council for Accreditation of Teacher Education. The Child Study Center and Child Development Center has received full accreditation as a Nonpublic and Special Purpose School from the Southern Association of Colleges and Schools (SACS) Council on Accreditation and School Improvement.

The recreation and tourism studies curriculum is accredited by the National Recreation and Park Association/American Association for Leisure and Recreation Accreditation Council. Both the undergraduate and graduate program emphasis areas in sport management have received program approval through the North American Society for Sport Management (NASSM) and the National Association for Sport and Physical Education (NASPE). The graduate program emphasis area in athletic training is accredited by the National Athletic Trainers Association (NATA). The graduate program in speech-language pathology is accredited by the Council on Academic Accreditation of the American Speech-Language-Hearing Association. The master's program in counseling is accredited by the Council for Accreditation of Counseling and Related Educational Programs.

The doctoral program in clinical psychology is accredited by the American Psychological Association. The undergraduate program in chemistry is American Chemical Society certified.

The undergraduate and graduate business programs of the College of Business and Public Administration are accredited by The Association to Advance Collegiate Schools of Business (AACSB)-International. The undergraduate and master's degrees in accounting are also accredited by the AACSB-International. The master's degree in public administration is accredited by the National Association of Schools of Public Affairs and Administration.

The program in dental hygiene is accredited by the American Dental Association Commission on Dental Accreditation. The nursing program is accredited by the Commission on Collegiate Nursing Education and approved by the Virginia Board of Nursing. Graduate nursing programs are approved by the Pediatric Nursing Certification Board, the National Nurses Certification Corporation, American Nurses Certification Corporation, and the American College of Nurse Practitioners. The certified registered nurse anesthetist

specialty is accredited by the Council on Accreditation of Nurse Anesthesia Educational Programs. The medical technology program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences, 8410 W. Bryn Mawr Avenue Suite 670, Chicago, IL 60631-3415, 773 714-8880. The physical therapy program is accredited by the American Physical Therapy Association, Commission on Accreditation in Physical Therapy Education (CAPTE). The environmental health program has been awarded accreditation from the National Environmental Health Science and Protection Accreditation Council. The nuclear medicine technology program is accredited by the Joint Review Committee on Educational Programs in Nuclear Medicine Technology. The Master of Public Health has received accreditation from the Council on Education for Public Health. The cytotechnology certificate program and the ophthalmic technology certificate program are accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP).

The Department of Music is a full member of the National Association of Schools of Music. The Department of Art is a full member of the National Association of Schools of Art and Design. The theatre program is accredited by the National Association of Schools of Theatre.

Affiliations

The University is a member of the Southern Association of Colleges and Schools, the American Council on Education, the National Commission on Accrediting, the Council of Graduate Schools in the United States, the American Association of State Colleges and Universities, the American Association for Higher Education, the Association of American Colleges and Universities, the Association of Governing Boards of Universities and Colleges, the Association of Urban Universities, the Council for the Advancement and Support of Education, the National Association of State Universities and Land Grant Colleges, the National Commission for Co-op Education, the Southeastern University Research Association, the American Association of University Women, the University Extension Association, the National Society for Experiential Education, the Universities Space Research Association, the American Association of Collegiate Schools of Business, the National Council for Accreditation of Teacher Education, the Association of University Evening Colleges, the National Association of College and University Summer Sessions, the Association of Virginia Colleges, the Association of Schools of Allied Health Professions, the American Association of Dental Schools, the American Society for Engineering Education, the Consortium for Oceanographic Research and Education, and the Conference of Southern Graduate Schools. The University is also a Division I member of the Collegiate Athletic Association (NCAA) and the Colonial Athletic Association (CAA).

Old Dominion University is authorized by the Washington Higher Education Coordinating Board (HECB) and meets the requirements and minimum educational standards established for degree-granting institutions under the Degree Authorization Act. This authorization is valid until June 30, 2010, and authorizes Old Dominion University to offer the following degree programs: Bachelor of Science in Business Administration: Accounting, Finance, Information Systems and Technology, Management, and Marketing; Bachelor of Science in Communication: Professional Communication; Bachelor of Science in Computer Science; Bachelor of Science in Criminal Justice; Bachelor of Science in Engineering Technology: Civil Engineering Technology; Electrical Engineering Technology; General Engineering Technology; and Mechanical Engineering Technology; Bachelor of Science in Health Sciences; Bachelor of Science in Human Services; Bachelor of Science in Interdisciplinary Studies: Professional Writing, Teacher Preparation (Pre-K through 6)*; Bachelor of Science in Nursing: RN to BSN; Bachelor of Science in Occupational and Technical Studies*; Master of Engineering Management; Master of Science in Community Health; Master of Science in Education: Military Career Transition Program [MCTP], Pre-K through 6; Middle School Education (Grades 6-8); Secondary Education (Grades 6-12); Secondary Education – Field Based; and Special Education*; Master of Science in Nursing: Nurse Educator; and Nurse Leader; Master of Science in Occupational and Technical Studies*; Doctor of Philosophy in Community College Leadership; and Doctor of Philosophy in Education with a concentration in Occupational and Technical Studies. Any person desiring information about the requirements of the Act or the applicability of those requirements to the institution may contact the HECB office at P.O. Box 43430, Olympia, WA 98504-3430.

*Prospective Washington state students are advised to contact the Office of the Superintendent of Public Instruction at 360-725-6320 or profed@k12.wa.us to determine whether this education program is approved for teacher certification or endorsements in Washington State. Additionally, teachers are advised to contact their individual school district as to whether this program may qualify for salary advancement.

Distinguished Faculty Chairs and Professorships

In 1964, Virginia became the first state in the nation to establish an Eminent Scholars Program. Virginia encourages donors to create endowments to attract and retain outstanding faculty members by matching the income from these endowments, thus doubling the impact of the donors' gifts.

The generosity of several individuals and groups has made it possible for the University to establish chairs and professorships to support faculty members and their scholarly activities through this program. Included in these gifts are the following:

The P. Stephen Barna Professorship Endowment. Mr. E. James Hayes, a 1989 alumnus of Old Dominion University, established a professorship for aerospace engineering in the Frank Batten College of Engineering and Technology in 2003.

The Richard F. Barry, Jr. Chair. Established in 1997, this endowment provides support for a chair in the College of Sciences Department of Mathematics and Statistics. Richard F. Barry III, a former member of the University's Board of Visitors and Vice Chairman of Landmark Communications, Inc., created the endowment in honor of his father who taught mathematics at the University.

The Batten Chairs. The Batten Chairs were established in 2003 by Frank and Jane Batten. Mr. Batten is the retired Chairman and CEO of Landmark Communications and was the first rector of the Board of Visitors. The Batten's \$32 million gift, the largest in Old Dominion's history, will benefit all six of the University's colleges with emphasis to the Frank Batten College of Engineering and Technology and the College of Sciences. The Batten Chairs include:

- Batten Endowed Chair in Jewish Studies**
- Batten Endowed Chair in Counseling**
- Batten Endowed Chair in Computational Engineering**
- Batten Endowed Chair in System of Systems Engineering**
- Batten Endowed Chair in Bioelectronics Engineering**
- Batten Endowed Chair in Micro- and Nano-electronics Engineering**
- Batten Endowed Chair in Modeling and Simulation Engineering**
- Batten Endowed Chair in Advanced Transportation Engineering**
- Batten Endowed Chair in Science**
- Batten Endowed Chair in Health Sciences**

The Frederick Wharton Beazley Professorship. Created by an anonymous donor in 1988, the professorship in the College of Business and Public Administration was established to honor Portsmouth philanthropist, Mr. F. W. Beazley.

The CBPA Endowed Professorship in Accounting. The Dean of the College of Business and Public Administration established a professorship in 2006 to attract or retain an accounting scholar. The endowment was funded initially by KPMG Partners.

The Richard T. Cheng Chair in Computer Science. In 1998, former faculty member Dr. Richard Cheng endowed a chair in the department in which he helped establish accreditation. He is the former Chairman and CEO of ECI Systems and Engineering.

The Commonwealth Professorships. Provided by an anonymous donor as a substantial endowment gift in 1967, the endowment supports professorships in any of the University's six colleges.

The Constance F. and Colgate W. Darden Professorships. The Dardens endowed two professorships, one in education and one in history, in 1976. The Darden College of Education was named in honor of Mr. Darden, a U.S. Congressman, former Virginia Governor and President of the University of Virginia.

The Mina Hohenberg Darden Chair in Creative Writing. This endowed English department professorship was initiated in 1997 as a memorial to Mina Hohenberg Darden by her family and friends. Mrs. Darden received three M.A. degrees from Old Dominion and was working toward an M.F.A. in poetry.

The Diehn Chair in Music. The Diehn Fund, established by the estate of F. Ludwig Diehn, provided the funding in 1999 for a chair in music. The Diehn Fund also supports the Diehn Concert Series and the Diehn Fine and Performing Arts Center.

The Dragas Professorship in International Studies Endowment. This endowment was established in 1996 by the George and Grace Dragas Foundation to create a professorship in international studies. Mr. Dragas is an alumnus and former Rector of the University's Board of Visitors.

The Ray Ferrari Endowed Professorship. A former student, E. James Hayes, instituted an engineering department professorship in 1997 to honor his mechanical engineering technology professor and mentor, Ray Ferrari.

The Mary Payne Hogan Endowed Professorship. Established in honor of Mary Payne Hogan, the endowment was created in 1997 by an anonymous donor. The professorship supports the College of Sciences, specifically in botany.

The Louis I. Jaffe Professorship. In 1968, an anonymous donor created a professorship in the College of Arts and Letters in memory of the Pulitzer Prize-winning editor of *The Virginian-Pilot*, Mr. Jaffe.

The George M. and Linda H. Kaufman Professorship. The Kaufmans endowed this professorship in 1985. A lectureship in public affairs also bears their name. Mrs. Kaufman is a former member of the Board of Visitors. Mr. Kaufmann led the effort to landscape the University's mall which was named in honor of his parents.

The William E. Lobeck, Jr. Endowed Chair. Established in 2002 by the Lobeck-Taylor Foundation, this funding created an endowed chair in advanced engineering environments in the Frank Batten College of Engineering and Technology. Mr. Lobeck is an alumnus and former president of the Auto Nation Rental Group of Republic Industries.

The Mitsubishi Kasei Professorship in Manufacturing Engineering. The Mitsubishi Kasei Corporation in 1990 established this professorship in manufacturing engineering in the Frank Batten College of Engineering and Technology.

The A.D. and Annye Lewis Morgan Professorship. The Morgan Trust established this professorship in 1986 consistent with the wishes of the Morgans. He was a successful Norfolk physician who also created a scholarship fund to benefit Old Dominion students. The professorship is for a faculty member in either the Frank Batten College of Engineering and Technology or the College of Sciences.

The Ruth M. & Perry E. Morgan Endowed Professorship. Mr. Perry Morgan, former Editor-in-Chief of *The Virginian Pilot*, established a professorship in the College of Arts & Letters in 1996 in honor of his wife, Ruth. The incumbent must have a doctorate in American literature with an emphasis in Southern literature.

Rosanne Keeley Norris Professorship. Frederick J. Norris '78, through a bequest in his will, established a professorship in 2007 in memory of his mother, Mrs. Rosanne Keeley Norris, who devoted her career to primary education in the California and Massachusetts public schools. Mr. Norris desired to assist the University in attracting and retaining outstanding faculty in the Darden College of Education.

Oceanography Professorships. A challenge gift from the Norfolk Foundation in 1975 and gifts in response from corporations, friends, and alumni made possible an endowment to support several professorships in oceanography.

The Perry Endowed Chair. Patricia W. and J. Douglas Perry initiated an endowment in 1997 to support a chair in the Psychology Department within the College of Sciences. Mrs. Perry is a former member of the Board of Visitors and Mr. Perry served on the board of Old Dominion University's Educational Foundation. The Perry Library is named in their honor.

The Professor of Computer Science Networking. The Professor of Computer Science Networking endowment was established in 1992 within the College of Sciences by the Department of Computer Science.

The Samuel L. and Fay M. Slover Chairs. A 1967 bequest from Mrs. Slover established an endowment which supports three chairs in oceanography. Col. Slover was the owner of *The Virginian-Pilot* and *The Ledger Star*.

The Oscar F. Smith Chair. The Oscar F. Smith Foundation made a grant in 1968 to establish an endowed chair in oceanography. The late Mr. Smith was president of Norfolk Shipbuilding and Drydock, Co., now Norshipco.

The William B. Spong, Jr., Professorship. In 1988, The Landmark Charitable Foundation endowed a professorship on behalf of *The Virginian-Pilot* and *The Ledger Star* to honor the former U. S. Senator and President of Old Dominion University. The professorship is for a faculty member in the College of Business and Public Administration.

The Robert M. Stanton Chair in Real Estate and Economic Development. Mr. Robert M. Stanton, a 1961 alumnus of Old Dominion University, established a chair in real estate and economic development in the College of Business and Public Administration in 2003. The purpose of the chair is to help develop and enhance the Center for Real Estate and Economic Development into a nationally recognized institution.

The Robert Stiffler Distinguished Professorship in Botany. The Robert Stiffler Distinguished Professorship in Botany was created in 2003 by an anonymous donor. The professorship in the College of Sciences honors 28 years of Robert Stiffler's service to *The Virginian-Pilot* and the community as a gardening columnist and expert. The chair will help Old Dominion University and the Norfolk Botanical Garden fulfill their research goals in the field of botany.

The Jesse and Loleta White Lectureship. Created in 1992 by the Aphasia Foundation of Virginia, this endowment supports a faculty position in the Child Study Center within the Darden College of Education.

E.V. Williams Endowed Chair in Marketing. Established in 2005 through a bequest of Mr. E. Virginius Williams, for the College of Business and Public Administration.

E.V. Williams Endowed Chair in Strategic Leadership. Established in 2005 through a bequest of Mr. E. Virginius Williams, for the College of Business and Public Administration.

Educational Foundation

The Old Dominion University Educational Foundation is a nonprofit 501(c)(3) corporation chartered in 1955 to receive and manage gifts that support the educational mission of the University. As of September 30, 2008, the Foundation was responsible for managing approximately \$159 million of endowment assets, including \$11 million of University endowments. The Foundation is supported by the University's Office of Development and is governed by a Board of Trustees consisting of alumni and friends of the University.

Intercollegiate Foundation

The Old Dominion University Intercollegiate Foundation was incorporated in 1964 to provide funds for the University to compete successfully in intercollegiate athletic programs. The Foundation is governed by a Board of Trustees comprising alumni and friends of the University. Its activities are coordinated through the Department of Athletics and the Office of Development.

Real Estate Foundation

The Old Dominion University Real Estate Foundation was incorporated in 1994 to receive, acquire and manage gifts of real property for the benefit of the University. The Foundation manages a number of properties near the Norfolk campus and the Virginia Beach Higher Education Center, as well as the development of the University Village. The Foundation is governed by a Board of Trustees consisting of alumni and friends of the University.

International Programs

To be named, Executive Director

The Office of International Programs (OIP) coordinates activities that focus on Old Dominion University's strategic commitment to campus-wide internationalization. These activities fall into three general categories, all of which are designed to expand student understanding of our interdependent world: encouraging the incorporation of international issues and perspectives into undergraduate and graduate education; facilitating international exchange of students and faculty; and sharing international interests and expertise with the broader Hampton Roads community that Old Dominion University seeks to serve. For more detailed information, visit the OIP website at www.odu.edu/oip.

OIP facilitates the development of the University's cooperative agreements and exchange programs with other institutions of higher learning around the world in order to encourage exchange of students and faculty as well as collaborative research. OIP staff provide advising support for international fellowships, such as the Fulbright, National Security Education Program, Gilman International Scholarship Program, and Freeman Foundation scholarships.

OIP sponsors and coordinates international programs that serve and involve the citizens of the region and the state. These may include appearances by foreign diplomats, scholars and artists, workshops for teachers and other professionals, and support for internationally-focused community organizations.

OIP includes the Office of Study Abroad and the English Language Center, both in Dragas Hall.

Office of Study Abroad (OSA)

Increasing global awareness happens in both the classroom and elsewhere on Old Dominion's multicultural campus, but there is no substitute for traveling abroad to acquire a personal perspective on our increasingly interdependent world. Old Dominion students participate in a wide array of study abroad experiences as an integral part of their college education. Faculty-led programs of study in the summer and over the spring and winter breaks are available in different subject areas (from Conflict Resolution in Northern Ireland to Geography Field Study in Costa Rica to French Studies in Tours to Business Studies in Korea and China). Semester and academic year study abroad programs and reciprocal student exchange programs offer long-term opportunities in virtually all areas of the world. Old Dominion is a member of

study abroad consortia that sponsor high quality programs around the globe, providing opportunities for exchange with over 100 universities overseas. Regardless of one's field of study, almost all Old Dominion students can study abroad. Practically all forms of student financial aid may be applied to an academic program abroad, and travel grants are available for many programs. Dean's Education Abroad Awards provide special support for selected majors, and internships, and volunteer and short-term work opportunities overseas are additional options.

The Office of Study Abroad administers overseas academic programs and authorizes transfer credit from approved programs of study. OSA maintains a library of study abroad directories (print and electronic), catalogs, videotapes, CDs and other reference materials from Old Dominion partner universities abroad; study abroad program brochures organized by country and region; atlases and travel guides; and reference materials on scholarships, internships and work abroad opportunities. A Study Abroad Fair is held every semester, and pre-departure orientation programs and "re-entry" sessions when students return from abroad are also organized by the staff. Please visit the OSA's web site at www.odu.edu/studyabroad.

English Language Center

The English Language Center (ELC) offers intensive English language classes (six seven-week sessions per year) for international students and members of the local international community in grammar, composition, reading/vocabulary, and speaking/listening at beginning to advanced levels. This academic program primarily prepares students for study at American colleges and universities or for using English in workplaces around the world.

The ELC also provides semester-long Undergraduate and Graduate Bridge courses for students who have been conditionally admitted to the University and who need to improve their English language skills. The ELC administers the institutional TOEFL several times a year. Admission to ELC programs does not confer admission to other academic programs at Old Dominion University. Visit the ELC website at www.odu.edu/esl.

Distance Learning

Old Dominion University's TELETECHNET program delivers graduate and upper-division undergraduate courses to students at community college sites and higher education centers across the Commonwealth of Virginia. Students are able to complete their entire degree program at local community college campuses. The participating community college provides course work required for the first two years of study and Old Dominion University provides the final two years of course work leading to a baccalaureate degree. Graduate programs are also available at these locations.

Old Dominion University's statewide network of site locations extends well beyond the community colleges with course offerings at various military bases and corporations. Out-of-state site locations are operating in Arizona, Maryland, and Washington state. At these sites students may register for classes, meet with advisors, and attend classes both on-site and using telecommunications technologies.

In addition, the University offers a variety of courses and degree programs using Internet technologies, such as web-based and videostreamed courses, that provide students the opportunity to take courses from any location.

Military Outreach

Old Dominion University is proud of its affiliation with military personnel and their families who represent all branches of the armed services. Courses are available on campus and at a distance in both synchronous and asynchronous formats using distributive media such as video-streaming, CD-Rom, and web-based technologies. Students will find a wide variety of programs to match their personal and professional development goals through the University's six colleges; i.e., Arts and Letters, Business and Public Administration, Education, Engineering and Technology, Health Sciences and Sciences. Old Dominion operates sites on or near military installations in and outside Virginia where, depending on the location, students can take classes on the base (www.dl.odu.edu/military/index.shtml). Distance learning counselors at all locations are trained to facilitate registration, admissions, and advising. The University is affiliated with the Servicemembers Opportunity Colleges (SOC), DANTES, and Troops to Teachers. ODU accepts tuition assistance and serves the special needs of veterans, on campus or at distance, with a dedicated staff. ODU is a member of the GoArmyED network, the USAF's Associate's to Bachelor's Cooperative (AUABC), and the Navy's NCPACE and partnership programs, all of which provide substantial credit for military training as well as flexibility, convenience, and affordability.

Higher Education Centers

Old Dominion University operates three higher education facilities in Hampton, Portsmouth, and Virginia Beach. These full-service higher education centers offer a wide range of academic programming, including programs and courses at the graduate level and at the upper-division undergraduate level. Courses are conducted on-site and through telecommunications networks. Each facility also offers non-credit courses and provides meeting and training facilities for government agencies, corporations and industry, and nonprofit organizations. Capabilities include seminar/meeting rooms, teleconferencing, and administrative support. Students are provided on-site registration, advising, textbook acquisition, computer labs, and access to the University's library and mainframe computer.

Peninsula Higher Education Center
600 Butler Farm Road, Suite 2200
Hampton, Virginia 23666
757-766-5200
757-766-5201 (fax)
phec@odu.edu
<http://www.odu.edu/peninsula/>

Tri-Cities Higher Education Center
1070 University Boulevard
Portsmouth, VA 23703
757-686-6220
757-686-6219 (fax)
ttntcc@odu.edu
<http://www.odu.edu/tricities>

Virginia Beach Higher Education Center
1881 University Drive
Virginia Beach, VA 23453
757-368-4100
757-368-4109 (fax)
vbhec@odu.edu
<http://www.odu.edu/vbhec>

Athletics

Old Dominion University's athletic program is among the most successful in the United States, boasting 28 Division I and four Division II team and individual national championships, including three in women's basketball, nine in field hockey, 15 in sailing, a women's tennis clay court national crown, a men's basketball Division II title, and three individual wrestling Division II titles.

The Department of Intercollegiate Athletics is the home for Old Dominion University's 19 varsity programs for men and women. Old Dominion University offers competitive programs for student-athletes in the following sports: football, men's and women's soccer, field hockey, men's and women's sailing, men's and women's basketball, wrestling, men's and women's swimming and diving, women's lacrosse, men's and women's golf, men's and women's tennis, baseball and women's rowing. The University plans to begin softball and women's volleyball in the near future.

Old Dominion University is a Division I member of the National Collegiate Athletic Association (NCAA) and the Colonial Athletic Association (CAA). The 12 teams in the Colonial Athletic Association include: The University of Delaware in Newark, DE, Drexel University in Philadelphia, PA, George Mason University in Fairfax, VA, Georgia State University in Atlanta, GA, Hofstra University in Hempstead, NY, James Madison University in Harrisonburg, VA, the University of North Carolina at Wilmington in Wilmington, NC, Northeastern University in Boston, MA, Towson University in Towson, MD, Virginia Commonwealth University in Richmond, VA, and the College of William and Mary in Williamsburg, VA.

All full-time enrolled students are invited to attend intercollegiate athletic events free of charge. Beginning two weeks in advance of a regular season men's or women's basketball game, an Old Dominion ID card may be used to pick up student general admission tickets at the Constant Convocation Center Box Office or Webb Center Information Desk. At each men's and women's basketball game, an Old Dominion ID and a ticket must be presented at the student gate entrance of the Constant Convocation Center. For soccer, baseball and other special athletic events, students are admitted at the gate by showing their current student ID card. For more information, call the Constant Convocation Center Box Office at (757) 683-4444, or check out the athletic website at www.odusports.com.

In addition, Old Dominion University provides students with a variety of recreational and intramural activities through its Recreational Sports Office. For more information on these activities contact the Recreational Sports Office at (757) 683-3384.

Accommodation of Students with Disabilities: Policy and Procedures

Statement: Old Dominion University is committed to achieving equal educational opportunity and full participation for persons with disabilities. It is the University's policy that no qualified person be excluded from participation in any University program or activity, be denied the benefits of any University program or activity, or otherwise be subjected to discrimination with regard to any University program or activity. This policy derives from the University's commitment to non-discrimination for all persons in employment, access to facilities, student programs, activities and services.

Disability Services shall oversee the assessment of student requests for accommodation and assistance and shall coordinate the development of the program among the student, faculty members, and department chairs. In addition, the office shall implement the University's disability program for students and supervise the delivery of equipment and services.

The director of equal opportunity and affirmative action is the Section 504 coordinator who will monitor the implementation of these guidelines.

The provisions of services to students with documented disabilities at Old Dominion University are based on the principle of non-discrimination and accommodation in academic programs set forth in the implementing regulations for Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. These services will be provided within the basic guidelines to follow, with the understanding that students with disabilities may require unique accommodations and must have their needs assessed on a case-by-case basis. The provision of accommodations for students with documented disabilities need not guarantee them equal results or achievement; accommodations must only afford them an equal opportunity for achievement. Old Dominion University is committed to providing students with documented disabilities the same opportunity to achieve academic success as it provides for all students.

I. Definition of Those Qualified for Assistance

The appropriate recipient of accommodations is defined as one who has a physical or mental impairment, which substantially limits one or more major life activities, such as walking, seeing, hearing, speaking, performing manual tasks or learning. In addition, a person who has history of such an impairment is qualified for assistance. With respect specifically to the post-secondary setting, such a person must be otherwise qualified under the academic standards requisite for admission in spite of the disability.

II. Recruitment

The Office of Admissions at Old Dominion University will make all reasonable effort to assure that all recruitment activities are made accessible to persons with documented disabilities. All schools hosting Old Dominion University recruitment activities will be encouraged to provide information that such facilities are accessible so that interested persons with disabilities will not be excluded or denied participation. In keeping with this policy, Old Dominion University will provide, if given adequate advance notice, such services as interpreters, audiotapes or reader services at recruitment functions.

III. Admission to the University

A. General Admission

The requirements for general admission for persons with disabilities are no different from other persons applying to Old Dominion University. The official application for general admission to the University will not ask for information concerning an applicant's physical or mental disability. However, there are programs within the University which have technical standards which must be met. A prospective student may choose to self disclose in the admissions process.

B. Acceptance to Specific Programs

Technical standards have been established by each academic program which describe the skills the student must have or be able to acquire in order to meet curriculum requirements and to perform successfully in an academic program. The University is not required to make major academic adjustments, fundamental changes, or substantially modify standards for acceptance into or completion of

any academic program. Students with disabilities interested in applying for acceptance to a particular program should assure that they are aware of any applicable technical standards.

If a question arises about the qualifications of a student with a disability who wishes to be accepted in a particular degree program, the department chair shall have the responsibility of deciding whether or not the applicant will be accepted to the program. After having considered the requests for accommodation presented by the student, as well as the technical standards for the requested program, the department chair shall determine whether or not the student is otherwise qualified for acceptance to the program.

In making the determination, the department chair should consult with the student's advisor and Disability Services. If after careful consideration, the department chair decides that the student is not otherwise qualified for acceptance to the program of study, the student will be advised of his or her academic options. The decision of the department chair may be appealed to the dean. The dean shall consult with the director of equal opportunity/affirmative action prior to deciding the appeal. The decision of the dean is final.

IV. Determination of Need for Reasonable Accommodations/ Academic Adjustments

Under Section 504, institutions are required to respond by making modifications in academic requirements as necessary to ensure that such requirements do not discriminate or have the effect of discriminating against a student with a disability.

The information sent to students upon acceptance to the University shall include a notice that it is the responsibility of students with a disability to contact Disability Services to arrange for accommodations. The information provided by the student in doing so will be kept confidential and shared only with those involved in arranging for accommodations.

Students who request reasonable accommodations must be prepared to provide documentation of the disability by a qualified professional, where appropriate, before accommodations will be implemented. Except under extraordinary circumstances, the documentation must be current, i.e., dated no more than three years prior to enrollment in the University.

Documentation must provide sufficient information to assist the institution in determining what difficulties the student would encounter in a normal learning environment. Although formats will vary, the following critical data should be included in any documentation in support of a request for accommodations:

1. The student's name, the dates of examination or testing, the examiner's name and credentials;
2. Reasons for referral;
3. The learning disability, a list of the tests administered, including the names of the tests as well as the version used;
4. An analysis or interpretation of test results;
5. Diagnostic summary with a brief composite of the entire assessment process (the summary should address the concerns raised in the "reasons for referral"); and
6. Recommendations of strategies to assist the student in becoming an efficient learner.

A student with a documented disability who has registered for class or has been accepted into the University can request support services and the use of assistive technology for classroom and extracurricular activities. The student must notify Disability Services of the accommodations required within a reasonable time prior to the date of anticipated need. Reasonable accommodations by the University are possible only after contact with Disability Services has been initiated. Students needing sign language interpreters or special equipment should provide 45 days notice to Disability Services.

A request for accommodation shall be assessed by the Office of Disability Services after carefully reviewing the diagnostic evaluation and the student's previous scholastic performance. Each will be reviewed on its own merit and verified by objective documentation about the effect of the specific documented disability on the ability to learn in the content area in question.

Students are encouraged to self-identify their documented disability to their professors at the beginning of each semester to avoid delays in receiving accommodations. If students are newly documented during the course of a semester, accommodations will be implemented within a reasonable time period, usually two weeks following presentation of the documentation.

In order to receive accommodations, students must supply their instructors with letters from Disability Services which verify their

disability and identify reasonable accommodations. The student and faculty member shall:

1. discuss the implementation of appropriate accommodations;
2. note their respective agreement to these accommodations; and
3. return the signed forms to Disability Services noting their agreement in the space provided.

Students who have a documented disability may elect not to disclose the disability. Should the student seek accommodations late in the semester, or if a student has a disability which is not obvious and chooses not to disclose it, then he/she should be aware that 1) all previous grades will stand as earned, and 2) accommodations will be implemented in a timely manner, usually within two weeks. For students who are newly identified and documented during the course of a semester and thus have not had the advantage of accommodations, considerations will be made on a case-by-case basis in consultation with all parties involved.

The types of accommodations provided to students with documented disabilities will vary depending on the nature of the disability and the course content. Often an initial trial-and-error period may be needed to determine the best way to accommodate a student's disability.

Disability Services will advise the students in writing of the results of the assessment. This notification to the student from the University shall serve as a guide for the provision of services from the University for the semester or situation specified.

If accommodations do not meet the needs of the student or are not implemented, the student should contact Disability Services for further assistance. Disability Services will determine the reasonableness of the accommodation(s) requested. If Disability Services determines that the request is reasonable, it will consult with the appropriate chair and, if necessary, the dean to reach agreement on the accommodations to be provided.

If Disability Services does not agree with the student's request, then the student may follow the procedures outlined in Section VI of this policy.

V. Support Services

A. Advising

Students with documented disabilities should make sure that their advisors are aware of the disabilities so that the advisor can guide the student as to course or degree requirements which may affect the student's completion of the course or degree program.

B. Classroom Accommodations

The University shall provide the following minimal accommodations for students with documented disabilities in the classroom: 1) classroom activities, including testing procedures and other methods of evaluation used for classroom participation, shall be reasonably modified to provide students with documented disabilities with the opportunity to participate; 2) the location of classrooms shall be changed as appropriate to accommodate the student with a disability; 3) a reasonable number of elective courses shall be held in accessible facilities; and 4) the use of special equipment and assistive technology.

C. Student Services and Activities

Students with documented disabilities at Old Dominion University shall be provided reasonable accommodation for participation in and use of student services and activities including housing, health insurance, counseling, financial aid, physical education, athletics, recreation, transportation, or other extracurricular programs or activities.

Given adequate notification, those students who require assistive technology and assistance for counseling settings will be provided with the aids and assistance necessary to participate.

At athletic and extracurricular activities, such as concerts and stage entertainment, special seating will be provided for students using wheelchairs as audience participants. For Old Dominion University sponsored lectures, cultural activities, convocations and commencements, the participation of students with documented disabilities shall be provided, upon request, through the aid of sign interpreters, assistive technology or other reasonable accommodation. Arrangements shall be made by Disability Services if sufficient notification is given.

D. Housing

Old Dominion University provides on-campus housing space which has been specifically reserved for occupancy by students with documented disabilities and is moderately barrier free. The University will provide and assign students with disabilities to housing as such space is available in residence halls and apartment settings. Roommates will be assigned to students with disabilities

occupying modified rooms in the same manner as other resident students.

It is the responsibility of the student to identify him/herself as a student with a documented disability seeking University housing in order to be considered for a reserved space. Application for a reserved space for a student with a disability should be made to Disability Services.

The Office of Student Housing will assign that space based on information provided by Disability Services. Priority will be based on the greatest physical need to live in University housing as a means of providing a student with a disability opportunity to successfully fulfill his/her academic program at the University. Final selection for reserved spaces for students with disabilities will be completed at a specified date in mid-summer of each year. Students will be informed of their room assignment by the Office of Student Housing. The remaining spaces reserved for students with disabilities will be turned over to the Office of Student Housing staff for assignment to students on the housing waiting list. Any student with a documented disability has the alternative of applying through the housing application process and is not required to take a reserved space. However, students who have special needs should make sure the regular housing space can accommodate their needs.

Rental rates for students with documented disabilities shall be set at the same rate as for any other student at Old Dominion University. The exception to this is the single room policy that provides for a limited number of single room accommodations available for qualified students with documented disabilities at the rate which would normally be charged for double occupancy. The request for single accommodations must be made to Disability Services and be properly documented. A final determination is made by Disability Services in collaboration with the Office of Student Housing. Returning students may request that they be assigned to the same space as in the previous year. Students should proceed through the regular housing process to request the same space.

VI. Complaint Resolution Process

If a student with a documented disability believes that he/she has not been provided with the services to which he/she is entitled, the student should direct his/her complaint to the University 504 coordinator who is the director of equal opportunity and affirmative action. The student shall provide to the director of equal opportunity and affirmative action, in writing, documentation of the disability, the nature of the discrimination, and any other information deemed important. The director will then attempt to reach an agreement through an informal mediation process. If an agreement is reached, a copy of the agreement shall be provided to the student and the faculty member. If an agreement cannot be reached, the director will convene an ADA Evaluation Committee for the purpose of evaluating the case and making a recommendation to the provost and vice president for academic affairs. The decision of the provost and vice president for academic affairs is final.

The members of the ADA Evaluation Committee will include the director of equal opportunity and affirmative action (chair), the general counsel, the director of disability services, the appropriate dean and a designated representative from Academic Affairs.

Electronic Messaging Policy for Official University Communication

Old Dominion University faculty, staff, and students must activate and maintain regular access to University-provided electronic mail accounts.

Faculty, staff, and students are required to use valid Old Dominion University email accounts to send official information and notices and are held responsible for accessing electronic mail to obtain official University communications.

Failure to access the electronic mail account will not exempt individuals from associated responsibilities and liabilities.

In general, electronic mail is subject to the same policies on information disclosure as other methods of communication.

Message content is the sole responsibility of the individual sending the message.

Administrative offices and academic departments are individually responsible for providing adequate advance notice when electronic communication is used as the method of communication. Disclosure should clearly identify the purpose and circumstances for which electronic

communication is the method of delivery. Instructors retain the discretion of establishing class expectations for email and other electronic messaging communication as a part of the syllabus.

Alternative services should be provided in cases where access to computing resources is limited or unavailable.

Firearms, Weapons, and Certain Related Devices

In the course of pursuing its mission as an institution of higher education of the Commonwealth of Virginia, Old Dominion University seeks to provide a safe and secure environment for its students, faculty, staff, and all others coming upon the campus. This policy regulates use of privately owned firearms, and prohibits firearms, related devices and weapons on campus to the extent permitted by law.

Application:

This policy applies to the University's students, its employees, volunteers, and invitees. Persons lawfully on campus, other than students, employees, volunteers, and invitees as these terms are defined below, are not subject to this policy other than paragraph 6, which does apply. Additionally, such persons may not carry firearms, related devices, and weapons in campus buildings, to University sports events, entertainments, or educational and cultural functions or events, whether held or conducted indoors or out.

Definitions:

1. "Campus" means any land in Virginia, with or without buildings or structures, owned or leased by the University, or otherwise under its control.
2. "Employee" means any person providing personal services under the direction and control of the University either full or part-time, whatever the basis for compensation may be.
3. "Firearms" means any pistol, rifle, shotgun, or other device designed or intended to propel a bullet, shot, or any other object of any kind as the result of an explosion of any combustible material whether or not the same is actually capable of being fired or discharged. "Firearms" includes pistols permitted to be carried or worn concealed. "Firearms" does not include firearms issued by the University, federal, state, and local agencies, departments, or the armed services, and carried in the performance of duty, or otherwise in accordance with the instructions of the issuing authority.
4. "Invitee" means any person other than an employee coming on campus for a business purpose, or in connection with the performance of a contract with the University. Solely for the purpose of this policy, the term does not include members of the general public including family of students, and alumni and former students of the University.
5. "Related Devices" means realistic replicas of firearms, including such replicas sold or traded as "toys" (other than transparent, brightly colored water guns), paintball guns, BB or pellet rifles and pistols, sling shots, bows and arrows, and crossbows and bolts.
6. "Students" means any person enrolled in one or more credit or non-credit courses or programs.
7. "Volunteer" means a person meeting the criteria of, and selected and supervised according to University Policy 6023, "Guidelines for the Use of Volunteers."
8. "Weapons," means knives (other than knives used for domestic purposes, pen or folding knives with blades less than three inches in length, and box cutters, and utility knives kept or carried for use in accordance with the purpose intended by the original seller), machetes, straight razors, spring sticks, metal knucks, blackjacks; any flailing instrument consisting of two or more rigid parts connected in such a manner as to allow them to swing freely, which may be known as a nun chahka, nun chuck, nunchaku, shuriken, or fighting chain; any disc, of whatever configuration having at least two points or pointed blades, which is designed to be thrown or propelled and which may be known as a throwing star or oriental dart.

Policy:

1. Firearms, weapons and related devices may not be carried, maintained or kept anywhere on campus, including in automobiles parked on campus, by employees, students, and volunteers.
2. a. During bow and crossbow hunting seasons, bows and crossbows with arrows and bolts may be stored with the ODU Police Department by students residing on campus, and may be so stored at other times for use in organized

competitions. The Department shall accept and store bows and crossbows in accordance with Department procedures. These procedures shall make provision for bow and crossbow storage at all times, and for reasonable access to withdraw them; and,

- b. Any student residing on campus having lawful possession of a firearm may store the firearm and ammunition at the ODU Police Department during any hunting season, and at other times for use in organized competitions and at target ranges licensed to do such business. The Department shall accept and store firearms in accordance with Department procedures; provided that such procedures shall make provision for firearms storage at all times, and for reasonable access to withdraw them.
3. For the purpose of the foregoing subparagraphs, bows, crossbows, and firearms shall be brought from their off-campus location directly to the place of storage designated by the Department.
4. Exceptions to this policy may, for good cause shown, be made at the discretion of the president and University police chief. Any such application shall be in writing, and shall state with particularity the exception sought and the reason for same. Additional information may be required of the applicant, and the application and any additional information may be required to be submitted in the form of an affidavit.
5. When firearms are carried on campus as permitted by this policy, they shall be carried with the muzzle angled up or down so as to avoid pointing the firearm at oneself, or any other person. All firearms, including those permitted to be concealed, having a safety shall have the safety in the "on" position. All semi-automatic firearms shall be carried with an empty breech or firing chamber. All revolvers shall be carried with an empty chamber to the immediate left or right of the barrel, depending on whether the cylinder turns clockwise or counterclockwise, and the chamber under the hammer shall be empty as well, unless the revolver is hammerless. All shotguns and other firearms that break to be loaded shall be carried broken and unloaded.
6. Violations of the foregoing policy shall be reported to the appropriate authority within the University for such disciplinary action as may be appropriate under the circumstances, including suspension, dismissal, and termination. Failure to report a violation of this policy may itself result in disciplinary action.

Inclement Weather and Emergencies

Statement: This policy concerns the operation of Old Dominion University (classes, academic services, and administrative operations) at its main campus in Norfolk, Virginia, the Virginia Beach Higher Education Center, the Peninsula Higher Education Center, and the Tri-Cities Higher Education Center as well as other off-campus locations in the affected geographic areas.

Responsibility

The Provost and Vice President for Academic Affairs (the Provost) is designated as the authority to close the university for reasons of inclement weather or emergencies. The authority will be exercised in consultation with the other vice presidents and the Director of Public Safety. Closing decisions will be communicated directly to the Vice President for Institutional Advancement as this position has primary responsibility for implementing the closing notification process. In the Provost's absence the responsibility for this function shall pass to the administrators in the following order of priority:

1. Vice President for Administration and Finance
2. Vice President for Student Affairs
3. Vice President for Institutional Advancement
4. Dean, College of Arts and Letters
5. Dean, College of Sciences

Procedures

1. In the event of inclement weather or emergencies outside of normal business hours which may affect the operation of the University, the Director of Public Safety will notify the Provost as early as possible of conditions which may require cancellation of classes or closing of the University. The Provost will inform the Director of Public Safety of his/her decision at that time. He/she will also inform the Vice President for Institutional Advancement.
2. The Office of the Vice President for Institutional Advancement will be responsible for informing students, faculty, and staff of a

decision to close the University because of inclement weather/emergencies. Local television stations, radio stations and newspapers will be informed immediately and urged to broadcast the closing.

Old Dominion University Child Study and Child Development Centers

The Old Dominion University Child Study and Child Development Centers follow the University's inclement weather/ emergency closing policy. Parents and faculty will be informed when the University closes due to weather. Announcements of University closings are given on all major TV and radio outlets in the local area. No refunds will be made for days or parts of days missed because of such closings. If, for any reason, one of the children's buildings is without power or flooded, or cannot be used (even though the rest of the University has re-opened), an additional effort will be made to notify all parents of those children affected.

Old Dominion University Discrimination Complaint Procedure

I. Purpose and Scope of the Procedure

A. Purpose

The purpose of the Discrimination Complaint Procedure ("the Procedure") is to promote equal employment, equal educational, and social opportunities for Old Dominion University employees and students by providing a means for the internal resolution of complaints of discrimination on the basis of gender, race, color, religion, national origin, age, disability, veteran status, sexual orientation or political affiliation.

B. Use of the Procedure

The Procedure may be used by any full- or part-time employee or student of Old Dominion University, who believes that he or she has a discrimination complaint as defined in the Procedures except as follows:

1. A student disciplinary action which must be appealed as described in the University's Student Disciplinary Policies and Procedures; and
2. The imposition of a faculty sanction, the termination of a faculty member for financial reasons, and a decision concerning the award of tenure to a faculty member, all of which may be reviewed only as described in the specifically applicable faculty personnel policies and procedures contained in the University's Faculty Handbook.

C. Use of Administrative Review Procedures

An employee or student must complete any existing administrative review procedures for review of an action about which the employee or student wishes to complain prior to filing a complaint under this procedure.

D. Use of Other Discrimination Complaint or Grievance Procedures

This Procedure is not to be used in addition to other internal discrimination complaint or grievance procedures which may be available to the employee or student who has a discrimination complaint. For example:

- 1) an employee covered under the Virginia Personnel Act who chooses to complain about an action through the grievance procedure described in the Virginia Personnel Act must raise a complaint of discrimination in his or her grievance; 2) a faculty member who chooses to complain about an action through the grievance procedure provided in the Faculty Handbook must raise a complaint of discrimination in his or her grievance; or 3) a student who chooses to complain about an action through any existing student grievance procedure must raise a complaint of discrimination in his or her grievance.

E. Use of External Discrimination Complaint Procedures

This Procedure affords a means for the internal resolution of discrimination complaints, and is not intended to be used in conjunction with external (i.e. State or Federal) discrimination complaint procedures. Therefore, this Procedure is not available to an employee or student who has filed a complaint with the Commonwealth of Virginia Department of Human Resource Management or with the U.S. Equal Employment Opportunity Commission. Any complaint pending under this Procedure will be dismissed upon notice to the University that a federal or state complaint has been filed.

II. Definitions

For the purposes of the Procedure, the following terms have the meanings ascribed to them as follows:

- A. Discrimination Complaint: A discrimination complaint is a written statement by an individual that he or she has suffered direct injury as a result of an action by a University official or employee which is intended on the basis of gender, race, color, religion, national origin, age, disability, veteran status, sexual orientation, or political affiliation.
- B. Complainant: The individual who files a discrimination complaint.
- C. Respondent: The University official or employee named in the discrimination complaint as having taken the action, which is the basis for the complaint.
- D. Director: The EO/AA director or the director's designated representative.

III. Administration of the Procedure

A. Responsibility for Administration

The Procedure will be administered by the director and all records resulting from a complainant's use of the Procedure will be maintained by the director. The director establishes and interprets the Procedure, assures compliance with the Procedure as it relates to employees and students, and is responsible for providing information to employees and students concerning the availability and operation of the Procedure.

B. Time Periods

1. With the exception of the time period described in paragraph V (B), designated vacation days of the University and days between the end of one University semester or summer session and the beginning of the next semester or summer shall not be included in the time periods described herein.
2. If, under the Procedure, a time period begins upon a party's receipt of notice, the time period will commence upon actual receipt of notice by the party or three (3) days after the notice was sent by certified mail to the last address shown on University records for that party.

IV. Informal Procedure

A. Informal Discussion

The director shall encourage an employee or student who has a complaint of alleged discrimination to discuss the complaint with the individual who took the action, which is the basis for the complaint. The Director may be present during such discussions if either party requests such.

B. Informal Resolution

Both parties to the complaint shall attempt to effect a resolution of the complaint through informal discussions.

V. Formal Procedure

A. Discrimination Complaint

An employee or student who has a complaint of illegal discrimination may initiate formally this discrimination complaint procedure by filing a written statement with the EO/AA Office. The written statement must include the following:

1. a description of the action upon which the complaint is based;
2. the date of the action or in the case of an action which was reviewed administratively, the date of the final administrative decision below the level of the president;
3. the name of the respondent, that is, the name of the University employee who took the action or, in the case of an action which was reviewed administratively, the name of the University official who made the final administrative decision, below the level of the president, in the review process;
4. the nature of the alleged discrimination;
5. whether the complainant has informally discussed the matter with the respondent and, if so, the results of those discussions; and
6. whether the complainant has pursued the complaint through administrative review procedures, and, if so, a description of those procedures and the results.

B. Time for Filing a Complaint

The written statement must be filed within one hundred twenty (120) calendar days of the date upon which either the action described in the complaint occurred or the final decision was made after an administrative review of the action, whichever was later.

C. Response to the Complaint

If the director determines that the written statement is complete and is a timely filed discrimination complaint, the director will notify the supervisor of the respondent. The respondent may respond in writing to the discrimination complaint; however, the respondent's written response must be received by the director within ten (10) days of the respondent's receipt of notice of the complaint. In the written response, the respondent may ask for an opportunity to resolve the complaint through discussions. If the respondent should ask for an opportunity to discuss the matter, the director will take no further action on the complaint for a period of ten (10) days from the date of the director's receipt of the written response so as to provide that opportunity.

D. Procedure for Investigating a Complaint

1. If the complaint is not resolved informally, the director will provide both parties with a reasonable time to choose whether to have an investigation made by the director or by a panel.
2. If either party should choose to have an investigation made by a panel, the discrimination complaint will be investigated by a panel.
3. If neither of the parties chooses to have the complaint investigated by the panel, the director will investigate the complaint. The director's investigation will commence within five (5) days of the director's receipt of notice of the election made by the parties or within five (5) days of the end of the period for making such an election, whichever is earlier. During the investigation, the director will, at a minimum:

- a. provide an opportunity to both the complainant and the respondent to meet with the director and discuss the complaint;
- b. attempt to interview all individuals whom the parties have identified as having pertinent information; and
- c. review all documents provided by the parties.

The director may interview also other individuals whom, in the director's judgement, have pertinent information and may review also other documents which, in the director's judgement, are relevant to the investigation of the complaint. The director will make a taped recording of all interviews. The director will conduct the investigation expeditiously and, upon conclusion of the investigation, will make a finding and recommendation as described in paragraph 6.

4. If either party chooses to have the investigation made by a panel, the panel will be composed of three members from the University's EO/AA Committee as follows:

- a. One member of the panel will be selected by the complainant and one member by the respondent. Neither of the individuals so selected may have had prior involvement in the action, which is the basis for the complaint. If either party chooses an individual with such prior involvement, that party will be given an opportunity to select another individual to serve on the panel.
- b. The third member of the panel and its chair will be the EO/AA director.
- c. A party whose initial selection is disqualified will be given three (3) days within which to select a replacement and to advise the director accordingly.
- d. If either party fails to select a panel member within the time period set by the director, the director will choose the panel member for that party.

5. The panel's investigation will commence within ten days of the panel's selection. The investigation will proceed as follows:

- a. The panel will hear a presentation by the complainant, during which the complainant will present his or her claim, pertinent witnesses and relevant documents.
- b. The panel will then hear a presentation by the respondent during which the respondent will present his or her response to the complaint, pertinent witnesses and relevant documents.
- c. A party may be present during the other party's presentation but witnesses will be present only while making statements to the panel.
- d. The panel members may question the parties and witnesses but must do so in a fair and objective manner.

- e. The panel members may request documents other than those presented by the parties and may interview pertinent witnesses other than those presented by the parties.
 - f. The chair will set the date(s), time(s) and place(s) of the panel's meeting(s) and will conduct the meeting(s). The chair may limit repetitive or irrelevant statements by the parties or by witnesses. The chair shall limit questioning by a panel member if that questioning becomes abusive, unfair, or repetitive. The chair may dismiss from a meeting any person, including a party, who becomes abusive or who obstructs or interferes with the meeting.
 - g. The meeting(s) will be closed. Taped recording(s) of the meeting(s) will be made.
 - h. Upon the conclusion of its investigation, the panel will meet to determine its finding and make its recommendation as described in paragraph 6 below. The panel's finding and recommendations shall be determined by majority vote of the panel members.
6. Findings and recommendations of the director or panel shall be made as follows:
- a. Where the director or panel finds that there is not probable cause to believe that discrimination has occurred, the director or panel shall recommend that the complaint be dismissed.
 - b. Where the director or panel finds that there is probable cause to believe that discrimination has occurred, the director or panel shall recommend a remedy, which the University's president has the authority to provide.

The findings and recommendation of the director or the panel will be forwarded to the University's president. The director, as chair of the panel, will communicate the decision of the panel to the president. Copies of the findings and recommendations will be sent to the complainant and the respondent. The taped record of the investigation and documents received during the investigation will be provided to the president with the director's or panel's decision.

E. Decision by the President

- 1. The president will make a final decision in the matter based upon the president's review of the findings and recommendations of the director or panel. The president will notify the complainant and respondent of the president's decision in writing within twenty-one (21) days of the president's receipt of the findings and recommendations. If the president disagrees with the panel's or director's findings and recommendations, the statement of decision will include a statement of reasons for the decision. If the president decides to provide a remedy to the complainant, the statement will include a description of the remedy to be provided. The president's decision is final.
- 2. When a remedy is provided by the president, the director will monitor implementation of that remedy.

VI. Assurance of Confidentiality and Retention of Records

- A. The complaint and all records developed during the investigations of the complaint shall be considered confidential and shall not be released except as required by law or by the provisions of this Procedure.
- B. The complaint and all records developed during the investigation of the complaint shall be retained for a period of two (2) years after the date of the president's decision. Thereafter the records shall be destroyed unless state or federal action is pending.

VII. Further Review of the Complaint

After the president makes a decision, there is no further University review of the complaint. A dissatisfied complainant may file a complaint of discrimination with the Commonwealth of Virginia Department of Human Resource Management, the U.S. Equal Employment Opportunity Commission, or the U.S. Department of Education, Office for Civil Rights.

Sexual Assault Policy

Statement: Sexual assault is defined as rape, forcible sodomy, sexual penetration with an inanimate object, fondling or touching of an unwilling person's intimate parts (genitalia, groin, breast or buttocks, covered or uncovered), or forcing an unwilling person to touch another's intimate parts.

Included in the offense of any of these acts are persons known to the victim as well as persons unknown to the victim. The offending act(s) can be committed through the use of force, the threat of force, by intimidation, or not forcibly/against the person's will, such as when the victim is incapable of giving consent due to the substantiated use of alcohol or drugs or for other verified reasons.

A sexual assault of any University student, faculty, or staff member which occurs either on or off campus and is perpetrated by another student, faculty or staff member will be adjudicated by using the disciplinary process appropriate to the alleged assailant. Disciplinary action may be initiated, in addition to, and separate from, any criminal charges which may be pending for the same alleged offense.

It is a violation of University policy for any member of the University community to make an intentionally false accusation of sexual assault.

Incidents of sexual assault can be reported to university authorities by contacting the Dean of Students and Chief Student Affairs Officer, a residence hall staff member, the Women's Center, Counseling Services, Student Health Services, or the Department of Public Safety. Each of these areas has individuals trained to handle reports of sexual assault.

When any staff or faculty member receives a report of sexual assault, the staff member must complete the Sexual Assault Incident Report (SAIR) form (anonymously at the victim's request) and submit it to the Sexual Assault Free Environment (S.A.F.E.) Program Coordinator in the Women's Center within 24 hours.

Counseling, crisis-intervention, and medical assistance will be made available to the victim through RESPONSE (757-622-4300) and through campus services such as the Women's Center, Counseling Services, and Student Health Services. A victim may choose to contact any of the above services for support and information whether or not she/he chooses to report the assault to the Department of Public Safety or the Police.

Sexual Harassment Policy and Procedures

I. Policy

A. Policy Statement and Responsibilities

- 1. Sexual harassment in any situation is reprehensible. It is the policy of Old Dominion University to provide students and employees with an environment for learning and working which is free of sexual harassment whether by members of the same sex or the opposite sex, which is prohibited by Title IX of the Education Amendments of 1972 and Title VII of the 1964 Civil Rights Act.
- 2. It is the responsibility of University administrators and supervisors to assure that effective measures are taken to implement the procedures outlined in this policy.
- 3. It is a violation of this policy for any member of the University community to seek gain, advancement, or consideration in return for sexual favors, or to make an intentionally false accusation of sexual harassment.
- 4. The University's EO/AA director must be advised of all complaints of reported incidents of sexual harassment. The Office of EO/AA will monitor repeated complaints or reports within the same unit or against the same individual, where appropriately identified, to assure that such allegations are fairly and properly handled.
- 5. Any person who has been accused of sexual harassment, pursuant to the terms of this policy, who retaliates against his/her accuser in any manner, shall be charged with a violation of this policy which shall be treated as an independent and separate act of sexual harassment.
- 6. Any member of the University community who is found in violation of this policy will be subject to appropriate sanctions, which may include discharge, expulsion or debarment.

B. Policy Definitions

- 1. "Work" for the purposes of this policy, means employment-related activities carried out by University employees and University-sponsored activities carried out by volunteers.
- 2. "Member of the University community," for purposes of this policy, means student or employee, or an alumnus, alumna, or volunteer involved in any University-sponsored activity.

C. Definition of Sexual Harassment

Sexual harassment is defined as unwelcomed and unsolicited conduct of a sexual nature, physical or verbal, by a member of the

University community of the opposite sex, or the same sex, in an official University position when:

1. Another of the University community member's submission to such conduct is made explicitly or implicitly a term or condition of the employee's work performance or the student's academic performance;
2. Another of the University community member's submission to or rejection of such conduct is used as a basis for an employment decision or an academic evaluation; or
3. Such conduct is known or should have been known to interfere with such person's work or academic performance, by creating an intimidating, hostile, or offensive working or educational environment.

A variety of sexual conduct directed at another University community member may be considered sexual harassment, including, but not limited to:

- offensive sexual innuendos, advances, propositions, threats, jokes, suggestive comments;
- graphic or degrading comments of a sexual nature about a person's appearance, whistling in a suggestive manner, obscene gestures;
- uninvited physical contact or touching such as pinching or intentional brushing against the body;
- solicitation of sexual favors through implicit or explicit promises of rewards or threats of punishment.

D. Power Differential, Consent and Sexual Harassment

Consenting romantic and sexual relationships between faculty and student, or between supervisor and employee, while not expressly forbidden, are generally deemed very unwise. A faculty member who enters into a sexual relationship with a student (or a supervisor with an employee) where a professional power differential exists, must realize that, if a charge of sexual harassment is subsequently lodged, it will be exceedingly difficult to prove a defense on grounds of mutual consent.

If conduct of a sexual nature has occurred or is occurring in an apparently consensual romantic or sexual relationship, and, if a complaint of sexual harassment regarding such conduct is filed by the student against the faculty member or the teaching/lab assistant, or by the employee against the University official, then sexual harassment shall be rebuttably presumed in such cases, when:

1. The relationship is between a faculty member or teaching/lab assistant and a student and:
 - a. The faculty member or teaching/lab assistant is in a position to determine the student's grade or otherwise affect the student's academic performance or advancement; and
 - b. The relationship began after the faculty member or teaching assistant was in such a position, or
2. The relationship is between an employee and a University official who is in a position to supervise the employee or otherwise influence the conditions of the employee's work and the relationship began after the supervisor was in such a position.

Sexual harassment is presumed under such circumstances because the power differential existing between the faculty member and student or the supervisor and employee may restrict the student or employee's freedom to choose to enter into the relationship. In order to rebut the presumption of sexual harassment, the faculty member, teaching assistant or other University employee or official who is charged with sexual harassment as a result of conduct occurring in a consensual relationship as described above must be prepared to prove, by a preponderance of the evidence, that the individual claiming sexual harassment entered into the relationship freely and voluntarily.

II. Committee on Sexual Harassment

- A. The president will appoint a Committee on Sexual Harassment consisting of individuals with professional training and/or experience such as would qualify them to assist victims of sexual harassment and those accused of violating this policy. The chair of the committee shall be the University's director of equal opportunity/affirmative action ("the EO/AA director"). The other members shall be as follows: two faculty members and staff members at large, a staff member from Counseling Services, a staff member from Student Health Services, and a staff member from the

Women's Center. Names of the members of the committee shall be publicized by the University.

III. Procedures for Enforcement of the Sexual Harassment Policy

Sexual harassment complaints can be made according to the procedures outlined below.

Members of the Sexual Harassment Committee shall assist members of the University community who are the object of sexual harassment, or who are accused of violating this policy. Committee members may also assist the EO/AA director in the informal mediation process by their direct involvement.

All student complaints of sexual harassment must be filed within two years from the date the alleged harassment occurred. Complaints by other members of the University community must be made within 120 days from the date the alleged harassment occurred.

A. STEP I

1. Any individual in the University community who believes she or he has experienced sexual harassment as defined in this policy should contact the EO/AA director or a member of the University Committee on Sexual Harassment.
2. The complainant may elect an informal process to mediate the complaint. This process provides an opportunity for the complainant and the accused to resolve the problem in an informal manner, without the necessity of disciplinary action or of the more formal procedures for processing a complaint.
3. The complainant may elect to file a formal complaint. The complainant shall explain, in writing, the nature of the harassment and indicate what remedy she or he seeks. The EO/AA director shall forward a copy of the complaint to the accused member of the University community and the appropriate supervisor/administrator, with a copy of this policy and advise him or her that an investigation of charges will be conducted.
4. The supervisor/administrator, working with the EO/AA Office, shall conduct a prompt investigation of the complaint. During the investigation, the individual accused of sexual harassment must be provided with an opportunity to respond, either orally or in writing, to the complaint.
5. In determining whether the alleged conduct constitutes sexual harassment, the supervisor/administrator will look at the record as a whole and at the totality of the circumstances, such as the nature of the sexual conduct and the context in which the conduct occurred.
6. Upon the completion of the investigation of the complaint, the supervisor/administrator shall submit the findings to the EO/AA director. In conjunction with the EO/AA Office, the supervisor/administrator shall seek to secure a written agreement that satisfies all parties to the complaint. If such an agreement is reached, a copy of the agreement shall be provided to each of the parties involved and the EO/AA director.
7. A resolution by agreement of the parties may include the imposition of a sanction upon the accused individual which the accused individual agrees to accept as a sanction.
8. If the proposed resolution is not accepted by the accused individual, the supervisor/administrator may impose a sanction.
9. The EO/AA director shall approve or modify a sanction or the terms of an agreement.
10. The accuser's right for redress under this policy shall terminate upon the imposition of a sanction.
11. If an investigation of a complaint exceeds thirty (30) days from the date of receipt by the supervisor/administrator, the EO/AA director shall notify the parties in writing of the progressive status of the investigation and the proposed extension of time needed for completion of the investigation.
12. Other related issues not specifically identified in the complaint may be brought to the attention of the appropriate administrator by the EO/AA director.

B. STEP II

1. Upon conclusion of the administrative review, if the complaint is unresolved and the complainant desires to proceed with the charge, the record of the complaint shall be provided to the chair of the appropriate administrative tribunal listed below.
2. Members of the Committee on Sexual Harassment may advise the complainant and the accused by clarifying and explaining

procedures, and promoting an equitable resolution for all parties.

3. The imposition of sanctions shall occur in accordance with applicable University disciplinary and sanction procedures.

C. University Complaint Resolution Procedures

1. A complaint of sexual harassment may be pursued in accordance with the appropriate University complaint resolution procedure:

Complainant	Procedure	Contact
Student	University's Discrimination Complaint Procedure or Student Conduct Committee	EO/AA Hearing Officer
Faculty	Faculty Grievance Procedure or University's Discrimination Complaint Procedure	Chair of the Committee EO/AA
Classified Employee	University's Discrimination Complaint Procedure or State Employee's Discrimination Complaint Procedure State Grievance Procedure	EO/AA Human Resources
Wage Employee	University's Discrimination Complaint Procedure or State Employee's Discrimination Complaint Procedure	EO/AA Human Resource
Administrator, Alumnus or Volunteer	University's Discrimination Complaint Procedure	EO/AA

2. The complainant shall not be entitled to more than one of the procedures for complaint resolution outlined in III.C.1.
3. The sanctions that may be imposed by the appropriate tribunal shall include but not be limited to:
 - a. For faculty, administrators, and staff — censure/reprimand, demotion, suspension without pay, or discharge.
 - b. For students — probation, suspension or expulsion.
 - c. For other members of the University community— reprimand, temporary or permanent debarment from University functions, activities and memberships.

IV. Sexual Harassment Committee

ReNeé S. Dunman, Chair, Director, Equal Opportunity/Affirmative Action
 Julie L. Dodd, Director, Women's Center
 Luisa M. Igloria, Associate Professor, English
 Lenora H. Thompson, Psychologist, Counseling Services
 Kathy C. Williamson, Employee Relations Manager, Human Resources
 Barbara A. Winstead, Professor, Psychology
 Michael T. Zugelder, Associate Professor, Finance

Smoking Policy

Statement: The intent of this policy is to create as nearly a smoke-free public environment as is possible. To this end, the following general policies are established:

1. Smoking is prohibited in all University facilities.
2. Smoking is prohibited within 20 feet of the entrance to any University facility.
3. Preferential consideration will be given to nonsmokers whenever it is determined they are being exposed involuntarily to smoke, whether directly or indirectly.

To enhance the implementation of these general policies, the following guidelines are established:

- A. Smoking is prohibited in all indoor and enclosed courtyard locations.
- B. Smoking is prohibited in all outdoor athletic facilities that are defined by a fence or wall and within 20 feet of fence or wall entrances.
- C. Smoking is prohibited in all University provided vehicles.
- D. Smoking is prohibited in any area in which a fire or safety hazard exists.
- E. All smoking materials (cigarette butts, matches, etc.) must be disposed of properly in a designated ash urn and not in a waste receptacle or thrown on the ground.

Implementation of this policy is the responsibility of administrative officers or their designees who have jurisdiction over the relevant facilities or areas. Implementation will include the following:

- A. Informing all people within the jurisdiction of the policy on smoking and non-smoking;
- B. Where appropriate, approving and designating smoking and non-smoking areas within their jurisdiction; and
- C. Assuring that smoking and non-smoking areas are appropriately marked.

Enforcement of the smoking policy depends on respect for the rights of and cooperation among all members of the University community. Complaints based on this policy and disputes arising from its implementation should be referred to the immediate supervisor of the relevant unit for resolution. Failing resolution at that level, the supervisor should refer the matter to the appropriate department or unit head, with final appeal to the vice president for administration and finance.

This policy does not supersede more restrictive policies which may be derived from and in compliance with federal, state or local laws, ordinances, and regulations.

Stalking Policy

Statement: Stalking is defined as an intentional course of conduct directed at another person or series of people which would cause a reasonable person to feel frightened, intimidated, threatened, or harassed. Stalking may occur when the person engaging in the course of conduct knows or should know that:

1. the conduct is unwanted; or
2. the conduct causes the other person(s) a reasonable expectation of imminent physical harm; or
3. the conduct causes substantial impairment of the other person's ability to perform the activities of daily life.

Examples of stalking behaviors include, but are not limited to:

- Repeatedly contacting or following another person or series of people
- Remaining in a person's physical or visual proximity
- Surveillance or other types of observation
- Harassment, either by the individual or through a third party
- Conveying verbal or written threats or threats implied by conduct (or a combination thereof)
- Use of electronic devices or software to track or obtain private information.

Students or employees charged with a violation of the stalking policy can be disciplined under the appropriate standards of conduct.

Counseling, crisis-intervention, and medical assistance will be made available to the victim through RESPONSE (757-622-4300) and through campus services such as the Women's Center, Counseling Services and Student Health Services. A victim may choose to contact any of the above services for support and information whether or not she/he chooses to report the stalking to the Department of Public Safety or Police.

Student Disciplinary Policies and Procedures*

I. Preamble

Students are expected and required to assume the responsibility for their own behavior and to abide by the laws of the Commonwealth of Virginia and the rules and regulations of Old Dominion University. A student who violates the following general standards of conduct may be subject to administrative actions (as defined in Section III-G), or to one or more disciplinary sanctions (as defined in section VII), whether or not civil authorities choose to prosecute.

* Policy may be revised in Fall 2009. Check website for Student Judicial Affairs for most current policy.

II. Authority

Old Dominion University is governed by its Board of Visitors and supported by the Commonwealth of Virginia. The Board is specifically authorized to regulate student conduct by state statute.

III. Definitions

As used in this document, the following terms shall have the meanings ascribed to them as follows:

- A. Vice president for student affairs (hereafter referred to as “vice president): The University official who has primary responsibility for the administration of all student discipline. He/she exercises final decision-making authority for cases which have been heard by the Student Conduct Committee. This official may delegate all or part of this responsibility to such other persons as he/she deems appropriate. In the event there is no vice president, the president shall designate the official to oversee this responsibility.
- B. Code of Student Conduct: The statement of rules and regulations governing student conduct as established by the Board of Visitors and contained in Section V herein.
- C. Chair: The head of the Student Conduct Committee and presiding officer at Student Conduct Committee hearings; a vice chair shall assume the duties of chair, when the chair is unavailable.
- D. Student: A person who (1) has been admitted to or has enrolled or intends to enroll at the University, and (2) has not completed a program of study for which he/she was enrolled. Student status continues whether or not the University’s academic programs are in session. For the purposes of pursuing alleged violations of the Code of Student Conduct, each student shall be responsible for his/her conduct from the time of application for admission through the actual awarding of a degree, even though conduct may occur before classes begin or after classes end (even if the student’s conduct is not discovered until after a degree is awarded).
- E. The Student Conduct Committee: A faculty/student judicial body authorized to hear and adjudicate alleged violations of the Code of Student Conduct.
- F. Administrative Action: The issuance of an oral or written warning, admonition, reprimand, and/or use of counseling procedures.
- G. University Hearing Officer: The University official or officials assigned by the vice president to conduct disciplinary proceedings and administrative action.
- H. Disciplinary Proceedings: Those proceedings initiated by a notice of charges and governed by the provisions of Section VIII. The term Disciplinary Proceedings does not include Administrative Action.
- I. Honor Council: A student organization which educates members of the academic community about the University’s standards of academic integrity. The Council also monitors student adherence to these standards, and provides panel members to serve on the Student Conduct Committee.

IV. Honor Code

“We, the students of Old Dominion University, aspire to be honest and forthright in our academic endeavors. Therefore, we will practice honesty and integrity and be guided by the tenets of the Monarch Creed. We will meet the challenge to be beyond reproach in our actions and our words. We will conduct ourselves in a manner that commands the dignity and respect that we also give to others.”

V. Code of Student Conduct

University students shall conduct themselves in a manner compatible with the University’s educational mission and shall be disciplined only for misconduct adversely affecting that mission, regardless of whether the alleged misconduct occurs on or off campus. The University will pursue off-campus misconduct only when the student’s behavior compromises the health, safety or well being of the University community or when the misconduct reflects upon a student’s fitness to remain enrolled at the institution. Specifically, students are subject to disciplinary action for the following:

- A. Academic dishonesty, including but not limited to, a violation of one or more of the following standards of academic honesty in any academic activity;
 1. Cheating: Intentionally or knowingly using unauthorized materials, study aids or other information. Examples of cheating include, but are not limited to, the following: using unapproved resources, information or assistance to complete an assignment, paper, project, quiz or exam; intentionally or knowingly collaborating on any academic work in violation of oral and/or written instructions provided by a faculty member; or submitting a paper for which the content and organization is

substantially the same as a paper previously submitted for another course, without first obtaining permission from the instructor of each course.

2. Plagiarism: Intentionally or knowingly representing the words or ideas of another as one’s own without properly acknowledging their source. Examples of plagiarism include, but are not limited to, the following: submitting a research paper obtained from a commercial research service, the Internet, or from another student as if it were original work; making simple changes to borrowed materials while leaving the organization, content, or phraseology intact; or copying material from a source, supplying proper documentation, but leaving out quotation marks. Plagiarism also occurs in a group project if one or more of the members of the group does none of the group’s work and participates in none of the group’s activities, but attempts to take credit for the work of the group.
 3. Fabrication: Intentionally or knowingly inventing, altering or falsifying any data, citation or information. Examples of fabrication include, but are not limited to, the following: citation of a primary source which the student actually obtained from a secondary source; or invention or alteration of experimental data without appropriate documentation (such as statistical outliers).
 4. Facilitation: Intentionally or knowingly helping another student violate, or attempt to violate, any standard of academic honesty, or failure to report known violations of academic dishonesty.
- B. Forgery, alteration, or misuse of University or other official documents, records, or identification;
 - C. Knowingly furnishing false information to the University;
 - D. Obstruction or disruption of University operations;
 - E. Obstruction or disruption of University-authorized activities;
 - F. Physical or violent verbal abuse of any person;
 - G. Conduct that threatens or endangers the health or safety of any person;
 - H. Theft of or damage to University property;
 - I. Theft of private property, or causing intentional or reckless damage to private property;
 - J. Unauthorized entry of University facilities or property;
 - K. Unauthorized access, use or misuse of University property including, but not limited to: attempting to leave the library with library materials which have not been properly borrowed; unauthorized use or misuse of computer equipment, computer accounts, computer software and hardware; or misuse of University telephones;
 - L. Violation of University regulations or campus policies approved by either the Board of Visitors or the president and described in official University publications, (e.g., Old Dominion University Catalog, Student Handbook, TELETECHNET Student Handbook);
 - M. Use or possession of alcohol, marijuana, narcotics, controlled substances, or drug paraphernalia (except as expressly permitted by law or University regulations);
 - N. The sale or distribution of marijuana, narcotics, or dangerous drugs;
 - O. Violation of University residence hall policies (consult the Residence Hall Handbook);
 - P. Lewd, indecent, or obscene displays of conduct;
 - Q. Drunken or disorderly behavior;
 - R. Intimidating behavior directed toward any student, faculty member, staff member, or administrator;
 - S. Failure to comply with the directions of University officials, their authorized agents, and local police agencies acting in the performance of their duties;
 - T. Violation of the University’s firearms policy;
 - U. Circulating a report or warning that property under University control or supervision may be subject to a bombing, fire, crime, emergency, or other catastrophe, knowing that the report or warning is false;
 - V. Tampering with safety equipment or the inappropriate use or possession of safety equipment on property owned or controlled by the University;
 - W. Giving false testimony or evidence at any official University hearing or to any University official;
 - X. Conduct deemed unlawful by any local, state or federal civil or criminal law. Violations of law may be regarded as a violation of

this Code regardless of whether the offense is prosecuted in a court of law;

- Y. Violations of the conditions of a sanction imposed through University disciplinary procedures;
- Z. Violation of the University's sexual assault policy;
- AA. The unreasonable use of complimentary materials and/or supplies provided for the benefit or consumption of the University community;
- AB. Retaliation;
- AC. Providing assistance to any person who violates, or attempts to violate, any portion of the Code of Student Conduct;
- AD. Impersonation of a University official.

VI. Violations of Residence Hall Rules and Regulations

It is recognized that living in groups requires a certain amount of tolerance and conformity by all concerned. Rules controlling conduct within housing owned or controlled by the University are promulgated by the Office of Student Housing to enhance the freedom and comfort of everyone living in the residence halls. These rules, along with procedures for their enforcement and applicable sanctions, are published in the Residence Hall Handbook available from the Office of Student Housing.

The Old Dominion University Code of Student Conduct and disciplinary procedures apply to all students, including those who live in the residence halls. Alleged violations of the Code by residence hall students will be forwarded to the vice president for student affairs or his/her designee.

VII. Sanctions

A student who violates the Code of Student Conduct may be subject to the following sanctions. Sanctions of suspension, dismissal and any grade sanction resulting from an act of academic dishonesty will be recorded on the student's official University transcript. Additionally, an "academic dishonesty" notation may be applied to the student's transcript as described in Section VIII.B. All sanctions will be recorded in the student's discipline file, which will be maintained by the Office of Student Judicial Affairs.

- A. Restitution
Restitution may include payment for damage to University property or facilities, payment for damage to the property or person of a member of the University community, and repayment of misappropriated or misused University funds.
- B. Disciplinary Probation
Disciplinary probation is a period of fixed duration in which the fitness of a student to continue at the University is evaluated. Disciplinary probation serves as a warning to the student that future violations of the Code of Student Conduct may result in more serious sanctions including suspension or dismissal. Subsequent violations which occur during the student's probationary period will normally result in a review for suspension from the University. Disciplinary probation may include mandatory conditions such as the following by way of illustration and not limitation:
 - Exclusion from privileged or extracurricular activities at the University;
 - Suspension of residence privileges in property owned or controlled by the University;
 - Educational sanctions, such as papers, projects, meetings or other appropriate educational activities;
 - Mandatory participation in classes, and/or other lawful activities deemed appropriate, as a means of rehabilitating the student found in violation of the Code of Student Conduct.
 - A fine of an amount specified by the hearing officer or Student Conduct Committee and approved by the vice president.In cases where misconduct is the result of abuse of alcohol or other drugs, mandatory alcohol or drug education may be a required condition of the probation.
- C. Disciplinary Suspension
Disciplinary suspension is the temporary separation of a student from the University. In cases of disciplinary suspension, tuition refunds will be evaluated in accordance with the Tuition Refund Policy as outlined in the Old Dominion University Catalog.
- D. Disciplinary Dismissal
Disciplinary dismissal is the permanent separation of a student from the University. In cases of disciplinary dismissal, tuition refunds will be evaluated in accordance with the Tuition Refund Policy as outlined in the Old Dominion University Catalog.
- E. Revocation of Admission and/or Degree
Admission to or a degree awarded from the University may be revoked for fraud, misrepresentation, or other violations of

institutional standards in obtaining the degree, or for other serious violations committed by a student prior to graduation.

- F. Summary Disciplinary Dismissal
Summary disciplinary dismissal is the immediate separation of a student from the University and is authorized by the vice president or a designated representative when the continued presence of the student at the University constitutes a danger to the health, safety, or welfare of the University community. At the time a student is summarily dismissed, the student shall be informed of his or her right to a hearing in accordance with the procedures contained in the Student Disciplinary Policies and Procedures. Such hearing shall be held without undue delay and the student shall remain dismissed until the hearing determines the student's status.
- G. Minimum Sanctions for Alcohol Violations
First Offense: Probation for one year, \$50.00 fine, mandatory workshop, parental notification for underage offenses.
Second Offense: Probation for an additional year, \$100.00 fine, additional workshop and/or counseling, parental notification.
Third Offense: Suspension for one semester, parental notification.
- H. Minimum Sanctions for Illegal Drug Violations
First Offense: Dismissal from University housing and disciplinary probation for one year; \$100.00 fine, mandatory workshop and parental notification.
Second Offense: Disciplinary suspension.
Persons found to be involved in the sale of illegal drugs will be subject to permanent dismissal from the University.

VIII. Disciplinary Procedures

- A. Administrative Action Proceedings
Administrative action proceedings are informal investigations conducted by a University hearing officer for alleged violations of University regulations by a student or a student organization. The hearing officer may take administrative action without instituting disciplinary proceedings, and such action shall be final and not subject to further hearing or appeal. A disciplinary penalty may not be imposed without first instituting disciplinary proceedings pursuant to the institution of disciplinary procedures.
- B. Academic Dishonesty Procedures
 1. Faculty members should clearly identify course specific standards which interpret University, college, and departmental policies related to academic integrity. These explanations should appear in the course syllabus and in all other explanations of course requirements. Faculty should require the inclusion of the honor pledge on all academic work submitted for grading.
 2. Faculty members who discover evidence of academic dishonesty may arrange to meet with the student(s) suspected of the alleged infraction or forward the case to the vice president. Violations that are purely technical in nature, without any perceived intent to achieve academic advantage, may be reported at the discretion of the faculty member. However, if the instructor wishes to impose a grade sanction for the violation, the Academic Dishonesty Procedures outlined in sections VIII.B.3–B.7 must be followed. At any time faculty members may choose to consult with the vice president or the Office of Student Judicial Affairs.
 3. If the student(s) acknowledge(s) the act of academic dishonesty, and the faculty member is satisfied that the incident can be effectively resolved with a grade sanction:
 - a. The faculty member will assign either an F in the course, or an F for the assignment or exam during which the cheating occurred.
 - b. The faculty member will forward a written summary of the incident to the Office of Student Judicial Affairs.
 - c. The hearing officer will contact the student to arrange a conference to review the Standards of Conduct related to academic dishonesty.
 - d. If the student is currently not on disciplinary probation, the student will be placed on disciplinary probation for one calendar year.
 - e. If the student is currently on disciplinary probation, or if the student has previously acknowledged an act of academic dishonesty and received a grade sanction as a result, disciplinary proceedings will be instituted to determine the appropriate disciplinary sanction. Such sanction may include suspension or dismissal from the University.

- f. All official disciplinary sanctions, including grade sanctions, which are assigned to a student as a result of an act of academic dishonesty, will be recorded on the student's official University transcript.
1. In the case of disciplinary sanction of probation assigned for Academic Dishonesty, a student will be given the option to petition the vice president for student affairs to have the "Academic Dishonesty" notation removed from his/her transcript if:
 - a. A minimum of one year has elapsed since the sanction was imposed; and
 - b. the student has successfully completed the University's "Academic Integrity Matters" Seminar; and
 - c. the student has not been found in violation of other Honor Code infractions during the student's tenure at the University; and
 - d. there is evidence that the academic dishonesty was not a premeditated act.
 2. Students may not utilize the grade forgiveness policy to retake the class in which the academic dishonesty occurred.
 3. The vice president for student affairs will notify the petitioner of his/her decision within three weeks of the receipt of the petition.
4. If the student denies the allegation of academic dishonesty, or if the faculty member believes the severity of the incident may warrant a sanction more severe than a grade sanction:
- a. The faculty member will forward a written summary of the incident to the University hearing officer. The summary must contain copies of all evidence including the names of any known witnesses to the alleged act of academic dishonesty.
 - b. The University hearing officer will institute formal Disciplinary Proceedings.
 - c. If the University hearing officer determines the student engaged in conduct prohibited by a standard of academic dishonesty described in this Code, but there is insufficient information to support the student violated the standard *knowingly* or *intentionally*, then the hearing officer may find the student responsible for the lesser violation of "academic negligence" in lieu of the previously alleged standard of academic dishonesty.
 1. Students may be found in violation of academic negligence only when the student has previously received prior notice regarding charges of plagiarism, cheating, collusion, or fabrication. Accordingly, a determination that a student has engaged in academic negligence may only occur after the hearing officer has instituted formal Disciplinary Proceedings.
 2. A determination that a student engaged in academic negligence will normally result in the imposition of a grade sanction and completion of one or more educational sanctions to improve the student's knowledge about appropriate academic conduct.
 3. A hearing officer may consider a student's prior violation of academic negligence when determining whether a student knowingly or intentionally violated a subsequent standard of academic dishonesty. In such cases, the hearing officer shall consider past misconduct when making a factual determination regarding whether a student knowingly or intentionally committed the violation, as past academic negligence leads to the rebuttable presumption that the student knew or reasonably should have known that the conduct in question was a violation of this Code.
 - d. No grade penalty should be assigned by the instructor until the case is finally resolved, including the process of hearing the student's appeal, if any. If the charges cannot be resolved prior to the end of semester, a grade of "I" should be assigned by the instructor. If a student withdraws from a course in which the alleged dishonesty occurs prior to the final resolution of the allegations, and the student is found responsible for the violation and a grade sanction is assigned, the grade sanction will appear on the student's transcript even when the student has previously withdrawn without a record of the student's registration appearing on the transcript.
- e. The faculty member will be notified of the final outcome in order that the appropriate grade may be assigned.
 - f. If a student accused of academic dishonesty is found to be not in violation, the student will have the option to withdraw from the course without notation on the student's academic transcript, even if the deadline to withdraw without a grade of "W" has passed.
5. Students found responsible for knowing or intentional violations of academic dishonesty will normally receive an "Academic Dishonesty" notation on the student's official University transcript.
- a. A student may petition the vice president to have the "Academic Dishonesty" notation removed from his/her transcript if:
 1. A minimum of one year has elapsed since the sanction was imposed; and
 2. the student has successfully completed the University's "Academic Integrity Matters" seminar or alternate educational activity approved by the vice president; and
 3. the student has not been found in violation of other Academic Dishonesty violations during the student's tenure at the University.
 - b. The vice president will notify the petitioner of his/her decision within three weeks of the receipt of the petition.
 - c. The Academic Dishonesty notation will not normally be removed from the student's transcript when the act of dishonesty involved significant deception or premeditation. A student may only petition to have one "Academic Dishonesty" notation removed from his/her transcript. Any subsequent violations that result in a transcript notation will not be eligible for removal and shall be permanently affixed on the student's transcript.
6. Students may not utilize the grade forgiveness policy to retake the class in which the academic dishonesty occurred. Nothing about this provision is intended to prevent a student from retaking a course required for advancement within the student's intended course of study.
7. Students may file a grade appeal if a grade penalty for alleged academic dishonesty violation occurs without proper adherence to the above procedures.
- C. Institution of Disciplinary Proceedings**
- Disciplinary charges brought against a student or a recognized student organization shall be adjudicated in the following manner:
1. Upon written notice of an alleged violation of the Code of Student Conduct disciplinary proceedings shall be instituted by the vice president or University hearing officer by the issuance of notice of charges. The written notice of complaint may be initiated by faculty, staff, students or through a campus police summons.
 2. The accused student will be informed of the alleged violation(s) in writing. The vice president will normally forward relevant evidence to a pre-hearing officer who will promptly schedule a pre-hearing conference with the accused student. Appropriate arrangements will be made for students at distance sites. The vice president may choose to bypass the pre-hearing and forward a case directly to a University hearing officer for the initial hearing. During the pre-hearing conference, the accused student will have the opportunity to discuss and review all evidence as well as ask questions about the charges and the options available for resolution. During this conference the student will be presented with the following options:
 - a. To plead in violation to the charges, waive all rights to a formal hearing and appeal and accept a sanction imposed by the hearing officer; or
 - b. To request a formal hearing with the right to appeal.

3. Students who fail to attend the pre-hearing conference will be considered in violation of the charges and an appropriate sanction will be imposed. Students who fail to attend a formal hearing will forfeit their right to appeal.

D. Formal Hearing Procedures

1. A student may request a new hearing officer if the accused student believes the assigned hearing officer cannot be unbiased. A hearing officer shall also remove him/herself from hearing a case if he/she believes him/herself to be biased. If an accused student requests the removal of a hearing officer, such a request must be received in writing within two business days following the date on which the notice of charge is sent. Requests should be submitted in writing to the director of student judicial affairs stating the precise reason(s) why the student believes the hearing officer assigned cannot be unbiased. The director of student judicial affairs will decide, in his/her sole discretion, if the hearing officer should be reassigned. If the accused student seeks to remove the director of student judicial affairs as the hearing officer, the request will be reviewed by the vice president. The accused student will be notified of the final decision and provided with the name of the new hearing officer, if reassigned. Whenever possible, the original date of the hearing will not change when a new hearing officer is assigned.
2. Rights of the Accused Student:
 - a. To be present at the hearing and hear all testimony presented. If a student, who has been properly notified, fails to appear at the scheduled date, time and place for the hearing, the panel may hear the case and make its findings in the student's absence;
 - b. To examine, prior to the hearing, evidence to be presented at the hearing, to the extent that it is available;
 - c. To be provided, prior to the hearing, evidence to be presented at the hearing, to the extent that it is available;
 - d. To question witnesses in accordance with the rules;
 - e. To present evidence in accordance with the rules;
 - f. To remain silent at the hearing.
3. The notice of charges and all other written notices shall be delivered to the accused student's official University e-mail address. Notices of charge for student organizations will be sent via e-mail to the organization's representative (the representative will normally be the organization's president as listed with the Office of Student Activities and Leadership). The notice shall include the portion(s) of the Code of Student Conduct allegedly violated and request the student or organizational representative to appear/participate at a specified time, date and place for a hearing. Other appropriate arrangements will be made for students at distance sites. Failure to read e-mail sent to the student's University e-mail address shall not invalidate the notice. If the notice is for a formal hearing, the student will be informed of the name(s) of any witness(es) the hearing officer will call to the accused student's hearing. The accused student shall also be informed of his/her rights to examine and be provided with a copy of all evidence available at the time of the notice.
4. If the notice of charges requests the appearance/participation of the accused at a hearing, and if the accused fails or refuses to appear/participate, the University hearing officer may, after such investigation that is deemed sufficient: dismiss the charges; take administrative action; or impose a disciplinary penalty.
5. Requests for continuance must be timely and made by the student in writing to the hearing officer, who may reschedule the hearing if the request is timely and for good cause. If the hearing officer takes administrative action, the accused student or organization shall be notified in writing of such action and such action shall not be subject to further hearing or appeal. If the hearing officer imposes a disciplinary sanction, the student or organization representative shall be notified in writing of such action. Appeals to disciplinary sanctions imposed at a hearing held in the absence of the accused student or organizational representative shall follow the procedures outlined in the disciplinary procedures.
6. When an accused student or organizational representative appears in response to the notice of charges, the hearing

officer shall review the facts of the alleged violations, and the names of witnesses then known to the hearing officer. The student or organizational representative shall be advised that no response is required and that any statement made shall become a part of the official evidence of the case. The accused may advise the hearing officer of any witnesses or evidence supporting the accused's position. The hearing officer shall also advise the accused that if any new evidence is discovered during an investigation subsequent to the hearing, it will be shared with the accused. The accused will have an opportunity to respond to the evidence. In certain cases an advisor may assist the hearing officer.

7. After the hearing with the student or organizational representative and such further investigation as the hearing officer deems necessary, the hearing officer shall proceed as follows: 1) If the hearing officer determines that the alleged violation is not supported by a preponderance of the evidence, the charges shall be dismissed and the accused student so notified. 2) If the hearing officer is satisfied that a preponderance of evidence supports the allegations, but that no disciplinary sanction should be imposed, the hearing officer may levy administrative action and notify the student accordingly. 3) If the hearing officer is satisfied that a preponderance of evidence supports a finding of responsibility and that a disciplinary sanction(s) should be imposed, the hearing officer shall so notify the accused student or organizational representative, describing the sanction(s) which the hearing officer will impose.
8. The accused may accept the decision and sanction(s) proposed by the hearing officer or, the accused student may request an appeal hearing before the Student Conduct Committee utilizing the procedures outlined in Section E. Faculty and other staff who have been involved in the hearing will be notified that the hearing has concluded and provided with any recommendation resulting from the hearing that requires their action.
9. Rules of Procedure:
 - a. In cases involving more than one student, the hearing officer may consolidate the cases for hearing, but shall make separate findings for each accused student.
 - b. The accused student may have an adviser of the student's choice present during the hearing. All advisers must be University community members, must have no other role in the hearing (such as a witness) and may not be lawyers. A lawyer will only be permitted to serve as an adviser when related criminal charges are filed and pending. In cases where a lawyer serves as an accused student's adviser, the student is responsible for any lawyer's fees incurred. Generally, the adviser shall be present for consultation purposes only and shall not be permitted to speak on the student's behalf. However, an adviser may be permitted to address the committee at the discretion of the hearing officer. If an accused student elects to be accompanied by a third party adviser, the accused student must provide a signed letter designating that person as their adviser before the University can communicate otherwise privileged information to the adviser.
 - c. Rules of common courtesy and decency shall be observed.
 - d. The questioning of any person appearing before the hearing officer by any individual participating in a hearing shall not be in a badgering, unduly repetitious, or irrelevant manner. It shall be at the discretion of the hearing officer to curtail a participant's further opportunity for questioning if such behavior occurs.
 - e. Any person may be dismissed from the hearing who interferes with or obstructs the hearing or who fails to abide by the rulings of the hearing officer.
 - f. The hearing officer shall have the right to call additional witnesses, require the presentation of additional evidence, and require additional investigation. A witness is regarded as someone who has personal knowledge of the incident at issue. Witnesses may have no other role in the hearing, such as an adviser, and shall be present only during their testimony and subsequent questioning.

Neither an accused student nor the complainant may question witnesses directly. Rather, questions will be submitted to the hearing officer, who will decide which, if any, of the questions to ask witnesses in order to preserve a non-adversarial tone during hearings. Hearsay witnesses may be considered at the discretion of the hearing officer for good cause. Character witnesses generally will not be permitted to provide statements. It will be the accused student's responsibility to forward a list of witnesses and a summary of each witness's expected testimony to the hearing officer no later than two business days prior to the student's scheduled hearing.

- g. A taped or stenographic record of a hearing may be maintained at the discretion of the vice president, or designee. Any taped or stenographic records made will become property of Old Dominion University. Generally, the record of the hearing will be established by the hearing officer's written hearing decision, to be delivered to the accused student after the conclusion of the hearing. The notice, exhibits, decision, and taped or stenographic record (if applicable) shall become the record of the case and shall be filed in the Office of Student Judicial Affairs.
- h. All hearings shall be closed.
- i. Formal rules of evidence used in courts of law do not apply in student judicial hearings.

E. Appeal Procedures

1. Only students who have attended and participated in their disciplinary hearing have the right to appeal the decision of the hearing officer. The appealing student may remain in class pending the outcome of an appeal. However, if the decision of the hearing officer is upheld, then sanction(s) will be imposed as of the original date unless the Student Conduct Committee affixes a different sanction date.
2. An accused student or organization appealing the decision of the hearing officer should file a notice of appeal to the Student Conduct Committee via the Office of Student Judicial Affairs. Such an appeal must be physically received in the Student Judicial Affairs office within five business days from the date of the letter containing the findings in the case. The appeal request must contain, at a minimum, a statement of grounds for appeal and a summary statement of the facts supporting such grounds. Grounds for appeal include:
 - a. A claim that a substantial deviation from published procedures unfairly and materially affected the outcome of the case;
 - b. A claim that the sanction(s) imposed was (were) inappropriate or overly harsh; (sanctions of reprimand and disciplinary probation, except in cases involving restitution, fines or academic dishonesty, are not subject to appeal);
 - c. A claim that the hearing officer abused his/her discretion;
 - d. New evidence, not known to the accused student in a previous hearing, which could exonerate the student.

F. The Student Conduct Committee

The Student Conduct Committee (hereafter "the Committee") is the appellate body within the University disciplinary system. It shall hear all appeals of decisions made by a hearing officer. The Committee shall consist of: faculty members appointed by the vice president from a list of nominees submitted by the Faculty Senate or from a list of faculty who have previously served; students appointed by the vice president from a list of nominees submitted by the Student Government Association or from a list of students who have previously served; and a chair from the faculty appointed by the vice president. Student nominees should consist primarily of members of the Honor Council. The term of office for these positions shall be one year and shall be renewable.

In order to provide for the prompt consideration and disposition of all cases, appeal hearings shall be conducted according to the following procedures:

1. All requests for appeal will be reviewed by the director of student judicial affairs to determine if the accused student has clearly outlined one or more acceptable grounds for appeal. The director will also review requests to ensure that a

statement of facts supporting these grounds accompanies the request for an appeal. Students who fail to outline acceptable grounds and a statement of supporting facts will be notified their appeal will not be processed due to failure to provide the required information. Students who identify acceptable grounds and a statement of supporting facts will have their appeal requests forwarded to the vice president. Students who wish to have witnesses provide statements at their appeal should include in their request a list of witnesses and a summary of each witness's expected testimony. Upon receipt of an appeal from the director of student judicial affairs, the vice president shall initiate a Student Conduct Committee appeal hearing by designating two faculty members and two student members to serve with the chair on a hearing panel. Faculty and student alternates will also be identified to serve in the event of an unanticipated absence of a hearing panel member. A hearing panelist shall remove him/herself from an appeal if the panelist believes he/she cannot be unbiased. The chair will preside, but will not vote, except in the event of a tie.

2. The vice president shall provide written notice to the student who filed the appeal including the date, time, and place of the hearing. This written notice will also contain a statement of the grounds for appeal to be considered by the Committee. This notice shall be delivered by email, or to the student's address currently on record with the University. If the student's address is not current, other reasonable attempts will be made to deliver the notice. Failure of the student to have a current address on record with the University, or failure to read email sent to the student's official University email address shall not invalidate the notice. The notice shall be given at least five working days before the hearing date, unless the vice president, for good cause, shall fix a shorter time. If a student who has been properly notified fails to appear for the hearing at the scheduled date, time, and place, the hearing panel may hear the appeal and make its findings in the student's absence.
3. A continuance of the hearing date may be requested by the accused student. Such requests must be timely and made in writing to the vice president, who shall have the authority to reschedule the hearing if the request is timely and for good cause. Usually, only one such continuance is granted. If a continuance is granted, the vice president shall notify both the student and the hearing panel of the new date for the hearing.
4. The format for the hearing shall be as follows: The chair shall call the hearing to order, call the roll of the panel in attendance, note the presence or absence of the student appealing the decision, read the notice of hearing, establish the presence of any adviser for the student, call to the attention of the student any special or unusual procedures to be used during the hearing, and permit the student to state the grounds for the appeal. Only evidence or witnesses that the chair deems relevant to the stated grounds for appeal will be heard. In certain cases the chair may be assisted by an advisor.

The appeal hearing shall be limited to testimony and evidence related to the grounds for appeal as stated by the accused student.
5. At the conclusion of the appeal hearing, the hearing panel shall recess the hearing and meet in executive session (out of the presence of all parties to the hearing) to determine its findings. The panel shall either recommend upholding the findings of the hearing officer or recommend that the decision of the hearing officer be modified. If the panel recommends that the hearing officer's decision be modified, the panel shall recommend either a different finding and/or sanction to the vice president. There shall be no findings to modify unless a majority of the hearing panelists agree that a preponderance of the evidence supports modifying the decision of the hearing officer. All hearing panel members are expected to cast a vote; however, all votes made by individual panel members shall remain confidential. The chair shall not be entitled to vote, except in the case of a tie.
6. Upon making its decision, the hearing panel shall so advise the vice president in writing within two working days after the date of the appeal hearing. The vice president will review the student's appeal and the recommendations of the Student Conduct Committee.

The vice president shall examine the record of the case and any additional evidence provided. The vice president may interview witnesses to the case, or engage in whatever investigation he/she deems appropriate to fully hear the student's appeal. The vice president shall consider the recommendations of the hearing panel and may accept or reject the recommendations of the panel. Nothing herein prohibits the vice president from consulting with other University officials concerning any appeal.

Within five working days after receiving the recommendation of the hearing panel, the vice president will advise the accused student of his/her decision concerning the final disposition of the case. However, the vice president may extend this deadline for good cause. The decision of the vice president is final and not subject to further appeal or consideration.

7. Rules of Procedure in Appeal Hearings:

- a. In cases involving more than one student, the vice president for student affairs may consolidate the cases for hearing, but the committee shall make separate recommendations for each accused student.
- b. The appealing student may have an adviser of the student's choice present during the hearing. All advisers must be University community members, must have no other role in the hearing (such as a witness) and may not be lawyers. A lawyer will only be permitted to serve as an adviser when related criminal charges are filed and pending. In cases where a lawyer serves as an accused student's adviser, the student is responsible for any lawyer's fees incurred. Generally, the adviser shall be present for consultation purposes only and shall not be permitted to speak on the student's behalf. However, an adviser may be permitted to address the committee at the discretion of the chair. If an accused student elects to be accompanied by a third party adviser, the accused must provide a signed letter designating that person as their adviser before the University can communicate to the adviser otherwise privileged information.
- c. Rules of common courtesy and decency shall be observed.
- d. The questioning of any person appearing before the hearing panel by any individual participating in a hearing shall not be in a badgering, unduly repetitious, or irrelevant manner. It shall be at the discretion of the chair to curtail a participant's further opportunity for questioning if such behavior occurs.
- e. Any person may be dismissed from the hearing who interferes with or obstructs the hearing or who fails to abide by the rulings of the chair.
- f. The chair shall have the right to call additional witnesses, require the presentation of additional evidence, and require additional investigation. A witness is regarded as someone who has personal knowledge of the incident at issue. Witnesses may have no other role in the hearing, such as an adviser, and shall be present only during their testimony and subsequent questioning. Neither an accused student nor the complainant may question witnesses directly. Rather, questions will be submitted to the chair, who will decide which, if any, of the questions to ask witnesses in order to preserve a non-adversarial tone during appeal hearings. Hearsay witnesses may be considered at the discretion of the chair for good cause. Character witnesses generally will not be permitted to provide statements.
- g. A taped or stenographic record of a hearing shall be maintained (not including subsequent deliberations occurring in the panel's executive session). Any taped or stenographic records made will become property of Old Dominion University. The notice, exhibits, taped or stenographic record, recommendation of the panel and final disposition of the case by the vice president shall become the record of the case and shall be filed in the Office of Student Judicial Affairs.
- h. All hearings shall be closed.
- i. Formal rules of evidence used in courts of law do not apply in appeal hearings.

8. The accused is entitled:

- a. To be present at the hearing and hear all testimony presented. If a student, who has been properly notified, fails to appear at the scheduled date, time, and place for the hearing, the panel may hear the case and make its findings in the student's absence;
- b. To examine, prior to the hearing, evidence to be presented at the hearing, to the extent that it is available;
- c. To be provided, prior to the hearing, with the names of witnesses whom the University hearing officer has asked to appear at the hearing;
- d. To question witnesses in accordance with the rules;
- e. To present evidence in accordance with the rules;
- f. To remain silent during the hearing.

G. Additional Procedures in Cases of Sexual Assault

1. The vice president shall schedule special training for the Student Conduct Committee and the hearing officer(s) once each semester covering the University's policies governing sexual assault, and the special needs of the accuser and the accused in these cases.
2. Upon notification of an alleged violation, the accused shall not initiate any contact, directly or indirectly, with the accuser. Retaliation against the accuser or against any witness involved in the case by the accused or others acting on behalf of the accused shall be considered violation of the Code of Student Conduct.
3. During a hearing, no evidence may be presented which pertains to the past sexual history of the accuser or of any witness.
4. During a hearing, unrelated past sexual history of the accused may not be entered as evidence nor discussed in the hearing.
5. The accused and accuser will be notified in writing of the outcome of Disciplinary Proceedings, any sanctions imposed and of the final action taken by the vice president on any appeal.
6. In cases where a sanction of disciplinary suspension or dismissal is imposed, a notation of the sanction will be recorded on the student's official University transcript.
7. The accuser shall have the right to have an accompanying adviser throughout a hearing.
8. The accuser shall be informed of all witnesses to be called, to the extent known, during a hearing.
9. A hearing involving charges of sexual assault shall be closed.
10. All proceedings in cases involving sexual assault will be treated confidentially, to the extent provided by law, and the identities of any involved party will not be disclosed to anyone not directly involved with the University's disciplinary process.

H. Mediation Option

Students seeking to file charges against another student that have arisen out of personal or group conflict may choose the mediation option instead of formal disciplinary proceedings. All parties to the conflict must agree in writing to have their dispute mediated.

The University hearing officer may assist the student in determining if the concern should be mediated or handled through the student judicial system.

Mediation is confidential and mediation agreements will be binding. Violation of such agreements may be referred to the student judicial process. The University hearing officer using trained mediators will schedule mediation sessions.

IX. Record Maintenance

Disciplinary files will be maintained and destroyed in accordance with the Commonwealth of Virginia's *Records Retention and Disposition Schedule*. All disciplinary case resolutions will be recorded in the student's discipline file, which will be retained by the Office of Student Judicial Affairs for a period of five years with the following exceptions:

- A. In cases of disciplinary suspension and disciplinary dismissal the disciplinary file will be retained permanently by the Office of Student Judicial Affairs.
- B. Records of disciplinary probation (excluding academic dishonesty cases) will be retained for one year after the conclusion of the probationary period.

Interim Suspension

The chief student affairs officer, or designee, may suspend a student from the University for an interim period pending disciplinary or criminal proceedings, or medical evaluation. The interim suspension shall become immediately effective without prior notice whenever there is evidence that in the opinion of the chief student affairs officer the continued presence of the student at the University poses a substantial and immediate threat to him/herself or to others, or to the stability and continuance of normal University functions.

A student suspended on an interim basis shall be given a prompt opportunity to appear personally before the chief student affairs officer or a designee in order to discuss the following issues only:

- a. the reliability of the information concerning the student's conduct, including the matter of his or her identity;
- b. whether the conduct and surrounding circumstances reasonably indicate that the continued presence of the student on University premises poses a substantial and immediate threat to him/herself or to others or the stability and continuance of normal University functions.

The suspended student shall be able to appeal the decision to the president, or the designee. The decision of the President, or designee, shall be final.

The chief student affairs officer and/or president, or designees, may impose conditions to re-admittance to the University as the conditions warrant.

Student Record Policy

A. PURPOSE

The University Student Record Policy is formulated to protect the privacy of the student information that is maintained, and yet provide access to student records for those having a legitimate reason to view such records. The regulations and procedures to ensure adequate protection of the student are provided in this policy.

B. AUTHORITY

The University Student Record Policy is intended to conform with all state and federal statutes dealing with access of information held by an educational institution on present and former students.

C. DEFINITIONS

"Records" refers to those files and their contents that are maintained by official units of the university.

D. SCOPE

The University Student Record Policy applies to the records of all students who attend or have attended Old Dominion University and to faculty and staff accessing student records for any reason.

E. POLICY STATEMENT

Generally, students have the right to review any official record that the university maintains on them. Generally, access to records by others, without student permission, is limited to purposes of an educational nature. When access is permitted, documents will be examined only under conditions that will prevent unauthorized removal, alteration or mutilation. Information to which the student does not have access is limited to:

- Financial records of parents or guardians;
- Confidential letters of recommendation received by the university prior to January 1, 1975;
- Specific confidential letters of recommendation received by the university on or after January 1, 1975, for which students have waived their right of access;
- Medical-psychological records used in connection with treatment of the student. Such records, however, can be reviewed by the physician or psychologist of the student's choice; and
- Office of Public Safety and Department of Human Resources records, when utilized for internal purposes by those offices in their official capacities.

The University Registrar is the custodian of the official academic record maintained by the University and is the office designated to release official transcripts on behalf of the University. The Office of the University Registrar is the initial point of contact for questions related to these rules. Subpoenas seeking education records are typically served on the University Registrar via University Police, and the Office of the University Registrar should be informed whenever the University or a University employee is served with a subpoena seeking education records. A copy of each subpoena shall be furnished to the Office of the University Counsel. No documents shall be released or information disclosed until University legal counsel determines that the subpoena is valid.

Only the following offices are authorized to release non-directory information upon written Authorization of the student, subpoena or court order: Office of the University Registrar, Career Management Center, Controller's Office, Financial Aid, Dean of Students and Chief Student Affairs Officer, University College, and Academic Colleges. The non-directory information that these offices are permitted to release includes, but is not limited to, the following:

- University Registrar: Admission Records, Cumulative Academic Records, Veteran's Records, Transfer Records
- Career Management Center: Information necessary to gain or maintain employment (part time, work/study, coop/internship, full time)
- Financial Aid: Financial Aid Records (scholarships, grants, etc.)
- Dean of Students and Chief Student Affairs Officer: Disciplinary and Student Organization Records
- University College and Academic Colleges: Advising Records
- Controller: Business Records (tuition, fees, etc.)

The appropriate official will collect and maintain records not included in the types above, making them available for inspection and review.

1. Access to Student Records by the Student

- a. A student has the right to inspect his/her record (as defined earlier in this section) and is entitled to an explanation of any information therein.
- b. Documents submitted to the university by or for the student will not be returned to the student. Academic records received from other institutions will not be sent to third parties external to the university or released to the student. The student must request those records from the originating institution.
- c. Official records and transcripts of the university (signature and/or seal affixed) will be mailed directly to other institutions or agencies at the student's request. Official records given directly to the student will be clearly marked "Issued to Student."
- d. Should a student believe his/her record is incorrect, a written request must be submitted to the appropriate university official indicating the incorrect information and the information that should be entered. The official will respond within 14 business days of the student's request.

2. Access to Student Records by Others

- a. Disclosures Subject to Student Injunction:
 1. Old Dominion University hereby designates the following information as public directory information. Such information may be disclosed by the institution at its discretion:
 - a. Name;
 - b. Address;
 - c. Telephone Number;
 - d. E-Mail Address;
 - e. Date of birth;
 - f. Gender;
 - g. Photograph;
 - h. Major field of study;
 - i. Participation in officially recognized activities;
 - j. Weight and height of athletic team members;
 - k. Dates of attendance;
 - l. Degrees, honors, and awards received; and
 - m. The most previous educational institution attended.

Except as described in item 7 below, directory information will not be released for commercial purposes by administrative offices of the university.

- b. Currently enrolled students may withhold disclosure of directory information under the Family Educational Rights and Privacy Act of 1974. To withhold disclosure, written notification must be submitted to the Office of the University Registrar to effect disclosure for the same term.
- c. Final grades should not be posted in a public

- place. Students should be referred to www.leoonline.odu.edu to view their grades.
- d. Confidential information is never released via telephone, regardless of the caller.
 - e. All other student information will be released only upon written request of the student, except those instances cited below.
3. Disclosure to Members of the University Community
 - a. Access to student records for administrative reasons for faculty and administrative staff is permissible provided that such persons are properly identified and can demonstrate a legitimate educational interest in the material.
 - b. Access to de-identified data for the purpose of research by faculty, administrative staff, and graduate students is permissible when authorized by the department head and the administrator of the office concerned. An authorization form that also specifies conditions of confidentiality is provided for this purpose.
 - c. Information requested by student organizations of any kind will be provided only when authorized by the Dean of Students and Chief Student Affairs Officer.
 4. Disclosure to Parents and Organizations Providing Financial Support to the Student
 - a. Records may be released without prior student approval to a parent or guardian on whom the student is financially dependent. Parents or guardians must furnish federal tax records for the prior year that demonstrate tax dependency to the Office of the University Registrar. Students will be informed when the record is released.
 - b. Records may be released to organizations providing financial support to a student upon official request and written waiver from the student.
 5. Disclosure to Other Educational Agencies and Organizations

Information may be released to another institution of learning, research organization, or accrediting body for legitimate educational reasons provided that any data shall be protected in a manner that will not permit the personal identification of the student by a third party.
 6. Disclosure in connection with audit or evaluation of federal or state supported education programs

Authorized representatives of the following entities are permitted access to student records when the disclosure is in connection with an audit or evaluation of federal or state supported education programs, or for the enforcement of or compliance with federal legal requirements that relate to those programs:

 - Comptroller General of the U.S.
 - Secretary of Education
 - U.S. Attorney General (for law enforcement purposes only)
 - State and local authorities

Information collected for this purpose must be protected in a manner that does not permit personal identification of individuals by anyone except to the officials of the agencies identified above and such records must be destroyed when no longer needed for the purposes identified above.
 7. University-Affiliated Foundations and Organizations

Under very specific and clearly defined circumstances, university-affiliated foundations or organizations may have access to student directory information and may release this information to third-party vendors for purposes of communicating with current and former students as well as parents about benefits offered by the vendor. These circumstances may include, but are not limited to, affinity partnerships with the Alumni Association.

This information may be made available to third-party vendors only when a formal request is made to and approved by the University Registrar, and only if the use

and dissemination of such information is consistent with University policies and procedures and State and Federal laws and regulations, including the Federal Educational Rights and Privacy Act (FERPA).

F. PROCEDURES

Administrators, faculty and staff who work with student records and confidential student information should complete training on the Family Educational Rights and Privacy Act of 1974 offered by the Registrar's Office and available on-line in several formats. Questions about the policy and implementation should be referred to the University Registrar.

G. RESPONSIBLE OFFICER

University Registrar

H. RELATED INFORMATION

U.S. Department of Education Family Policy Compliance Office; Family Educational Rights and Privacy Act of 1974 (FERPA) <http://www.ed.gov/policy/gen/guid/fpco/ferpa/index.html>
 American Association of Registrars and Admission Officers (AACRAO) (<http://www.aacrao.org/compliance/ferpa/index.cfm>)

Academic Resources

University Libraries

The University Libraries consist of the Patricia W. and J. Douglas Perry Library, the Elise N. Hofheimer Art Library, and the F. Ludwig Diehn Composers Room. Collections of 3.2 million items in all fields of instruction include online journals, e-books, monographs, print journals, government publications, maps, musical scores and recordings, and other media. The University Libraries contain research-level print and online collections supporting graduate programs and faculty research specialties. Library services and resources are available from the University Libraries web site located at www.lib.odu.edu. There, students will find the library catalog and online academic journals and indexes from Perry Library and from the statewide Virtual Library of Virginia (VIVA) program. Perry Library serves as a repository for United States and Commonwealth of Virginia government publications. Its special collections houses manuscript collections of regional history, Tidewater collections and the University Archives. Through the Virginia Tidewater Consortium, students and faculty have borrowing privileges from the other academic libraries in the region. All library facilities also offer study space.

The Elise N. Hofheimer Art Library: Diehn Fine and Performing Arts Center, Room 109, 683-4059. Art Library collections contain specialized books, journals, electronic resources, and other materials for students and faculty in the visual arts. Reserve materials for Art Department classes are available at the service desk. Visit the Art Library web site at www.lib.odu.edu/artlib.

The Diehn Composers Room: Diehn Fine and Performing Arts Center, Room 189; 683-4173. The F. Ludwig Diehn Composers Room's Listening Library houses music special collections, scores, music videos, and sound recording collections and a full complement of audio equipment for many formats. Additionally, MIDI, multi-media, DCD, VCR, and laser disc player stations are available. Reserve materials for Music Department classes are available at the service desk. The Reading Room offers space for the study of manuscripts and other materials from special collections. The seminar room is available for course level instruction and is equipped with data connections and whiteboards for instructional activities. Data connections and electrical outlets are available for laptop computer use throughout the facility. A Steinway grand piano affords scholars and researchers the opportunity to play selections from the special collections as desired. Information on services and collections is located at www.lib.odu.edu/musiclib.

Perry Library offers many services and resources:

Circulation and Reserve Services: 1st Floor, 683-4154. Students with a valid University ID may borrow and renew books and other materials and obtain reserve materials. Group study rooms, laptop computers, and graduate student study carrels are also available. Information on borrowing privileges, loan periods, and policies is available at www.lib.odu.edu/services/circulation.

Computer Lab: Room 164, 683-6097. A University computer lab provides access to the office and specialized applications, as well as to online subscriptions and other Internet resources. Computer Center personnel are available to assist students.

Digital Services Center: Room 341, 683-5953, 4184. The Digital Services Center provides scanners and other hardware to assist University faculty, staff, and students with digitizing materials for course and research-related projects. Faculty can arrange for classes to receive training and assistance with Web publishing and other multimedia projects. Staff in the Center also participate in work on various digital collections and projects of the library. Detailed information about services can be found at www.lib.odu.edu/dsc.

Interlibrary Loan Services: Room 109, 683-4170, 4171. Interlibrary Loan Services facilitates research by obtaining materials from other research libraries. The University Libraries have access to the holdings of other libraries worldwide. A statewide interlibrary loan agreement among the Virtual Library of Virginia (VIVA) participants ensures that students and faculty may obtain items located in another Virginia library. Document delivery services provide copies of materials held in the University Libraries' collection to distance learners. Interlibrary loan and document delivery requests can be submitted online through ILLiad. Online ILLiad registration and request forms are available at www.lib.odu.edu/services/illiad/.

Library Services for students with disabilities: The University Libraries offer a variety of services for students with disabilities including a computer equipped with a scanner, voice synthesizer, and specialized programs that read scanned text aloud or enlarge the text on any screen. Circulation Services offers an "on-demand service" for patrons who may need special assistance retrieving library materials. Students may inquire about library services at the

University's Disabilities Center or at the library's Circulation and Reference Services departments.

Microform Services: Room 219, 683-5912. Microform Services is an open stacks area where users have easy access to the collections. Staff assist with locating materials, use of the equipment, referrals to other library services, and collections content. Printing is available and is fee based. Additionally, the Serials Service Desk is located on the second floor to provide assistance with the journal collection, general collection, and materials not held by the library.

Photocopy Services: Self-service copiers are available on the first and second floors of Perry Library. Assistance is available at Circulations Services, Microform Services, and Reference Services. Network printing is available from the public workstations located in Reference and Research Services. A bill changer machine is located on the first floor. Photocopying and network printing is fee based. Photocopy costs may be charged to department or grant funds with appropriate authorization.

Reference and Research Services: 1st Floor, 683-4178. Reference and Research Services provides students and faculty with services and materials to support instruction, research and student assignments. Research help is provided at the Reference desk through direct individual assistance and consultation for more extensive assistance. Reference assistance by telephone, e-mail and live chat is also available. While most significant resources are available through online subscriptions, the department also houses print reference materials and an extensive collection of print and electronic government publications. Distance learning students may obtain assistance by calling the department or using the *Ask A Librarian* e-mail or chat reference service at www.lib.odu.edu.

Research Commons: Reference area, 1st Floor, 683-4178. The Research Commons is a large computer work area within Reference and Research Services that provides access to MS Office and other software applications for students, faculty and staff, as well as to online library resources. Reference staff is available to assist students.

User Instruction: Reference and Research Services offers library instruction for academic classes as well as workshops, tours and special programs to assist graduate and undergraduate students with library research. A current schedule of library workshops, tutorials, other online research guides, and additional information on instruction services can be found at the Library's web site, www.lib.odu.edu/libassist/classes/index.htm.

Computing and Communications Services

As technology continues to change the way faculty teach and students learn, the Office of Computing and Communications Services (OCCS) maintains a leadership role in Old Dominion University's dedication to providing technology-intensive disciplines and innovative educational delivery processes. With responsibility for research, consultation, support, and maintenance for computing and communications technology for the University, OCCS is committed to delivering high-quality computer, information processing, and telecommunications services.

In addition to maintaining the University's administrative system, OCCS provides/manages all computing accounts for faculty, staff, and students. The department also maintains Academic Computer labs, instructional labs, University-wide data and telecommunications networks, and the University telephone system, and provides media technology equipment in support of academic and University-related activities. Technology support services for faculty, staff and students include a Technical Support Center that is open over 75 hours per week, with 24-hour telephone and e-mail problem reporting. A Student Team provides peer-to-peer and walk-up technical support for students and on-site support for students in university housing.

Detailed information about these services is provided in the following paragraphs. Additional information about all computer services at Old Dominion University can be found on the OCCS web site at www.occs.odu.edu.

Computer Accounts

In support of the University's mission of teaching, research, and other educational pursuits, OCCS provides three types of accounts for all students – MIDAS account, University student e-mail account, and University student LAN account. All accounts are established electronically via the University web site.

MIDAS (Monarch Identification and Authorization System), released in January 2004, is gradually moving the University to "same sign on" for all technology access. The account is created from the MIDAS web site at <http://midas.odu.edu>. The establishment of a security profile allows the account holder to create a new password without knowing the current password. A MIDAS account is required to log in to the University Portal, a web site that

can be customized by the individual with links to the web resources accessed most frequently (see section below on University Portal). The account provides a universal ID and password that is used to access Blackboard, on-line courses, faculty web pages and lecture notes, video streaming courses, Faculty/Student Communication System (FSCS) and many other important resources. Activation is immediate for mail purposes, but may require 24-48 hours for access to resources on other servers. (Blackboard is a web-based course management system that incorporates web pages, e-mail, discussion boards, chat rooms, online quizzes, virtual groups, and document sharing. FSCS is a web-based utility that allows course instructors and students enrolled in the course to add documents directly to a shared database.) The Student LAN Account is also required for students to access the Internet from University-supplied connections in the individual dorm rooms and common areas in the residence halls, and from wired jacks in several main campus buildings. Additionally, a University LAN account is required to access the University's wireless network (see section on Wireless LAN).

University Student E-Mail Account provides a vital communication link between students and University administrators, departments and faculty members. This account will be activated on line as part of the MIDAS account creation process.

Student LAN Account is required for students to log in to computers in all University public computer labs, OCCS-supported departmental labs, and some department-supported labs on the main campus and at the Virginia Beach, Peninsula, and Tri-Cities Higher Education Centers. This account will be activated on line as part of the MIDAS account creation process.

Computer Labs

OCCS maintains University public computer labs equipped with Windows (XP and Vista) and Macintosh-based systems and various computer applications in support of class requirements. Laser printing is available in all labs. Students must have a University MIDAS account (see section on Accounts) to use the computers in the labs. Labs are located in: University Library, Webb Center, Virginia Beach Higher Education Center, Peninsula Higher Education Center, and Tri-Cities Higher Education Center. Lab schedules are posted on the OCCS web site at www.occs.odu.edu 24 hours per day/seven days per week. IT consultants are available in all labs to provide assistance with application and computer-related questions and problems.

Technical Support Center (TSC)

The Technical Support Center (TSC), located in Webb Center, is the central point of contact to the Office of Computing and Communications Services. The TSC may be reached by telephone at (757) 683-3192 or by e-mail to occs-help@odu.edu 24 hours per day/seven days per week. OCCS personnel coordinate responses to computing problems and questions and, when necessary, forward inquiries to the appropriate support group. Students may also request technology information and report technology/telecommunications problems to the TSC on line at fp.odu.edu.

Internet Access

In partnership with Network. Virginia, high-speed Internet connectivity is provided to all workstations on the University network, including computer labs, offices, and wired dorm rooms. In the residence halls, sufficient Internet connections are provided to allow each resident an individual connection. Student assistants provide support with set up and connectivity issues.

Mobile Monarch

The University strongly recommends that all incoming freshmen have a notebook that at least meets the University's minimum requirements. While students are strongly encouraged to purchase one of the recommended program notebooks, students may bring a non-program notebook to campus.

MONARCHtechstore

Located in the University's Webb Center, the MONARCHtechstore offers a lowest-price guarantee on computers, peripherals, hardware, software, and supplies. Updated information is available at www.odu.edu/techstore.

MONARCHVision

MONARCHVision is the University's Campus Video/TV Network with service provided in all Residence Halls.

Software Download

Through the University's software licensing program, some software is made available for students to download to their personal computers. This software includes Xwin 32 and the most current versions and upgrades of the McAfee VirusScan software. Downloadable software is available on the OCCS web site at www.occs.odu.edu – Enter as Student, click on Software, and then click on University License Software available for download for all Students, Faculty, and Staff. When prompted for authentication, enter MIDAS ID and password.

University Portal

The Old Dominion University Portal, located at <https://my.odu.edu>, provides University faculty, staff, and students a single point of access to their University services. Individuals may customize their portal page with links to the resources they access most frequently, including Blackboard, Leo Online, University-wide announcements, and Internet-based University email, address book and calendar.

Wireless Local Area Network (WLAN)

Available almost universally across the Norfolk campus and at the Higher Education Centers in Virginia Beach, Hampton, and Portsmouth, the WLAN makes it possible for faculty, staff, and students to access the Internet from their laptop computers while enjoying a Starbucks coffee in Webb Center, conducting research in the University Library, or enjoying the sunshine in Tonelson Garden. A University MIDAS account (see section on Accounts) is required to access the wireless network.

Research Resources

Research Foundation

The Old Dominion University Research Foundation is a separate, private, not-for-profit corporation chartered under the laws of the Commonwealth of Virginia in 1965. The foundation serves as the fiscal and administrative agent to manage research and sponsored programs and aid in technology commercialization for Old Dominion University. The foundation's purpose is to promote the education, research and public service objectives of Old Dominion University by encouraging, advancing, fostering, and conducting research and sponsored programs in engineering, the physical and life sciences, the humanities, education, and all other branches of learning.

The foundation is the contracting agent for University research grants and contracts with external funding agencies. In fiscal year 2008, the Research Foundation received \$43 million in awards for research and sponsored programs. Research and sponsored program activity for fiscal year 2008, measured by amount of expenditures, totaled \$43.1 million for projects sponsored by federal, state, and local government agencies and a variety of corporations and private foundations.

Technical direction of a sponsored program remains the responsibility of the principal investigator. The foundation supports the University and assists investigators by providing a broad range of administrative and technical support services. Among these services are: financial administration, budget preparation and monitoring, financial compliance guidance, proposal preparation and submission assistance, project payroll and human resources, financial reporting, technical reporting support, intellectual property administration, procurement and equipment inventory control.

Office of Research

Old Dominion University is classified as a Research Institution having high research activity, according to the Carnegie Foundation. In FY 2007, its total research and development (R&D) including institutionally-financed expenditures amounted to \$73.6 million. In an effort to sustain, enhance and grow its research enterprise, Old Dominion's Office of Research serves the faculty, staff, and students by providing basic research administrative services. The office also provides interface with public and private members of the external community as well as federal and state agencies that have a vested interest in research. The office is led by the institutional research officer and includes staff members who are able to leverage a breadth of experience and convey quality services related to development of research programs, regional economic development, compliance in the conduct of research, grant writing and development, intellectual property, technology transfer, and governance issues related to sponsored programs. Sponsored research administration services, encompassing the range of pre- and post-award grant and contract administration, in particular, are provided by the ODU Research Foundation.

While most of Old Dominion's research enterprise centers and entities are housed within specific colleges, the ones that are the most diverse in terms of their research focus and/or scope are configured within the Office of Research. The Virginia Modeling, Analysis, and Simulation Center (VMASC), the Frank Reidy Research Center for Bioelectrics, the Virginia Coastal Energy Research Consortium (VCERC), the Animal Facility and the Orchid Conservatory are five such entities.

VMASC is a multi-disciplinary modeling, simulation and visualization collaborative research center that supports the University's modeling and simulation graduate degree programs, offering multi-disciplinary master's and Ph.D. degrees to students across the colleges. With more than 100 industry, government, and academic members, VMASC furthers the development and application of modeling, simulation, and visualization as an enterprise decision-making tool and promotes economic development. Its core capabilities are: military modeling and simulation (primarily combat simulations), homeland security and homeland defense, medical simulations, transportation, serious gaming, and enterprise executable architectures. VMASC creates computer simulations and conducts program analyses to meet stakeholders' needs. Computer simulations provide the capability to: quickly and economically test theories and ideas; help visualize and understand complex situations; prioritize labor and capital investment opportunities; and reduce the risk inherent in business decisions. The research interests and capabilities of VMASC include: simulation methodologies, mathematical modeling, verification and validation, distributed simulation, computer visualization, immersive virtual environments, human-machine interfaces,

human factors, performance analysis, intelligent systems, decision support and collaboration methodologies, and modeling and simulation systems integration.

The Frank Reidy Research Center for Bioelectrics exemplifies Old Dominion's leadership role in the understanding of the interaction of electromagnetic fields and ionized gases with biological cells and the application of this knowledge to the development of medical diagnostics, therapeutics, and environmental decontamination. The center was developed as a research initiative with Eastern Virginia Medical School (EVMS). The objectives of the center are to perform leading edge interdisciplinary and multi-institutional research, recruit top faculty and exceptional graduate students, and support regional, national and international programs. Research conducted in bioelectrics has already attracted substantial federal agency support, including the award of a \$5 million Multi-University Research Initiative grant from the Air Force Office of Scientific Research as well as major funding from the National Institutes of Health. As the first institutions to apply this technology in medicine and biology, Old Dominion and EVMS anticipate the potential for proprietary use of the technology, with both marketing and licensing opportunities.

The Virginia Coastal Energy Research Consortium (VCERC) is a multidisciplinary research unit charged by the Commonwealth to study and identify alternative solutions to problems arising from overdependence on fossil fuels that is unsustainable and has become the single biggest threat to our environment, economy, and national security. Virginia, with its vast coastline, natural waterways and abundant sunshine, is ideally suited for a number of alternative energy applications. VCERC seeks out and develops new alternative energy research directions and evaluates viable renewable energy sources for Virginia with an initial focus on offshore winds, waves, and marine biomass. At Old Dominion University, VCERC involves faculty researchers from the Batten College of Engineering and Technology and the College of Sciences, and is structured to operate in partnership with a number of Virginia institutions: Virginia Tech – Alexandria Research Institute, Virginia Institute of Marine Science, Norfolk State University, James Madison University, Virginia Commonwealth University, University of Virginia, and Hampton University. This statewide, inter-university network seeks to become a leader in the research and development of numerous alternative energy projects that are of direct benefit to local employment, manufacturing groups, state institutions, the students and staff of Virginia universities, and the public.

Research and Enterprise Centers

The University has established a number of research and enterprise centers. Please check the web pages of the Office of Research www.odu.edu/ao/research and those of the individual colleges for information regarding centers in specific areas.

GRADUATE STUDIES AT OLD DOMINION UNIVERSITY

www.odu.edu/ao/gradstudies

210 Koch Hall
Norfolk, VA 23529
757-683-4885

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Our Role

- Articulate a Vision of Excellence for the Graduate Community
- Provide Quality Control for all Aspects of Graduate Education
- Maintain Equitable Standards Across All Academic Disciplines
- Provide an Interdisciplinary Perspective
- Enhance the Intellectual Community of Scholars Among Faculty and Students
- Serve as an Advocate for Graduate Education
- Develop Ways for Graduate Education to Contribute to and Enhance Undergraduate Education
- Emphasize the Importance of Preparing Future Professoriate and Professionals
- Support Graduate Student Services and Quality of Life
- Serve as an Advocate for Issues and Constituencies Critical to the Success of Graduate Programs.

Our Services

- Program & Curriculum Development & Approval
- Graduate Administration Oversight and Training
- Graduate Policies and Procedures
- Graduate Information Management & Reporting
- Enrollment Management
- Financial Support and Tuition Waivers
- Graduate Faculty Certification
- Training Programs for Teaching Assistants, Research Assistant, Graduate Assistant, Graduate Program Directors and Support Staff
- Student Appeals – Grievances, Probation, Suspension
- Periodic Program Assessments & Reviews
- Joint-Multi-Institutional Programs

Synopsis of Graduate Degree and Post-Baccalaureate Certificate Programs

College of Arts & Letters	DEGREE	MAJORS			
	Doctor of Philosophy (Ph.D.)	Criminology/Criminal Justice	English	International Studies	
	Master of Arts (M.A.)	Applied Linguistics	Applied Sociology	English	History
		Humanities	International Studies	Visual Studies**	
	Master of Fine Arts (M.F.A.)	Creative Writing	Visual Studies**		
	Master of Music Education (M.M.E.)				
Graduate Certificate Programs	Literature	Professional Writing	Teaching of Writing	TESOL	
	Women's Studies				
College Of Business And Public Administration	DEGREE	MAJORS			
	Doctor of Philosophy (Ph.D.)	Business Administration	Public Administration & Urban Policy		
	Master of Art (M.A.)	Economics			
	Master of Business Administration (M.B.A.)				
	Master of Science (M.S.)	Accounting	E-Commerce Systems**		
	Master of Public Administration (M.P.A.)				
	Master of Urban Studies** (M.U.S.)				
Graduate Certificate Programs	Homeland Security	Maritime, Ports and Logistics Management	Advanced Certificate in Public Administration and Policy	Modeling and Simulation	
Darden College of Education	DEGREE	MAJORS			
	Doctor of Philosophy (Ph.D.)	Community College Leadership	Counseling	Curriculum & Instruction	Early Childhood Education
		Educational Leadership	Higher Education	Human Movement Science	Instructional Design & Technology
		Literacy Leadership	Occupational & Technical Studies	Special Education	
	Educational Specialist (Ed.S.)	Counseling	Educational Leadership		
	Master of Science in Education (M.S.Ed.)	Biology	Chemistry	Counseling	Early Childhood Education
		Educational Leadership	Elementary Education	English	Physical Education
Reading		Secondary Education	Special Education	Speech-Language Pathology	
Master of Science (M.S.)	Occupational and Technical Studies				
Batten College of Engineering and Technology	DEGREE	MAJORS			
	Doctor of Engineering	Aerospace Engineering	Civil and Environmental Engineering	Engineering Management and Systems Engineering	Mechanical Engineering Modeling and Simulation
	Doctor of Philosophy (Ph.D.)	Aerospace Engineering	Civil and Environmental Engineering	Electrical and Computer Engineering	Engineering Management
		Mechanical Engineering	Modeling & Simulation		
Master of Engineering (M.E.)	Aerospace Engineering	Civil Engineering	Computer Engineering	Electrical Engineering	
	Environmental Engineering	Experimental Methods	Mechanical Engineering	Modeling & Simulation	

		Motorsports Engineering	Systems Engineering			
	Master of Science (M.S.)	Aerospace Engineering	Civil Engineering	Computer Engineering	Electrical Engineering	
		Engineering Management	Environmental Engineering	Mechanical Engineering	Modeling & Simulation	
	Master of Engineering Management (M.E.M.)					
Graduate Certificate Programs	Advanced Engineering	Bioelectrics	Coastal Engineering	Homeland Security		
	Modeling and Simulation	Professional Study in Engineering Management	Wireless Communication			
College of Health Sciences	DEGREE	MAJORS				
	Doctor of Nursing Practice					
	Doctor of Philosophy (Ph.D.)	Health Services Research				
	Doctor of Physical Therapy (D.P.T.)					
	Master of Science (M.S.)	Community Health	Dental Hygiene			
	Master of Science in Nursing (M.S.N.)					
	Master of Public Health (M.P.H.)					
	Graduate Certificate Programs	Healthcare Management	Occupational Safety			
College of Science	DEGREE	MAJORS				
	Doctor of Philosophy (Ph.D.)	Applied Experimental Psychology	Biomedical Sciences	Chemistry	Computational and Applied Mathematics	
		Computer Science	Ecological Sciences	Human Factors Psychology	Industrial / Organizational Psychology	
		Oceanography	Physics			
	Doctor of Psychology (Psy.D.)	Clinical Psychology				
	Master of Science (M.S.)	Biology	Chemistry	Computational and Applied Mathematics	Computer Science	
		Ocean and Earth Sciences	Physics	Psychology		
	Graduate Certificate Programs	Geographic Information Science	Psychology	Spatial Analysis of Coastal Environments	Modeling and Simulation	

**Planned for discontinuation.

Graduate Admission

Office of Admissions

The mission of the Office of Admissions is to recruit, admit and enroll students from throughout the United States and abroad who will contribute to the overall collegiate experience. Old Dominion University is open to all qualified students regardless of race, sex, age, national origin, veteran status, disability, political affiliation or sexual orientation.

General Requirements for Admission

For regular admission, applicants must have earned a bachelor's degree from an institution accredited by a regional accrediting body or an equivalent degree from a foreign institution. An applicant must have earned at least a 2.80 cumulative grade point average (4.00 scale) for admission to a master's program and at least a 3.00 cumulative grade point average for admission to a doctoral program. Additional requirements are imposed by individual graduate programs. For specific program requirements, prospective students should consult the appropriate section of this catalog and contact the appropriate graduate program directors.

Students who apply before completion of undergraduate work may be admitted on the condition that the bachelor's degree is received before the beginning of actual graduate studies.

Students whose backgrounds are judged to be deficient in any specific area of study or whose undergraduate grades or test scores are below the required average may be admitted provisionally and asked to make up the deficiency by taking one or more courses at the undergraduate level. Graduate credit will not be awarded for these courses.

Standardized Tests

The Graduate Record Exam (GRE) and the Graduate Management Admission Test (GMAT) are normally required for admission. Test scores are considered valid for five years. Students with test scores older than five years should contact the program director for guidance.

Required by some programs, the Miller Analogies Test (MAT) is administered by appointment through the University Testing Center. Applicants should contact that office to make arrangements for taking the MAT.

Some programs require that students take the Exit Examination of Writing Proficiency, administered by the University's Writing Center, prior to completion of nine graduate hours of study. Graduate students in additional programs must take the Graduate Writing Proficiency Examination administered and evaluated by the College of Education.

Academic Testing

The University Testing Center is part of University College and is located in the Gornto TELETECHNET Building. Personnel from the Testing Center administer University placement tests, College-Level Examination Program (CLEP) exams, DANTES, the Miller Analogies Test (MAT), and correspondence tests, and coordinate entrance and certification test administrations. For information on testing, please see the web site at www.odu.edu/testing.

Application Procedures

Individuals interested in graduate work at Old Dominion University should apply on line at admissions.odu.edu or contact the Office of Admissions to obtain the forms and information. The applicant must first complete the Application for Admission to Graduate Study (and include the application fee), then arrange for the submission of official transcripts from each college or university previously attended. The completed application and supporting documents should be sent to the office of Admissions by the deadlines established by the programs to ensure complete processing of an application. Transcripts are not required of the non-degree applicant for initial registration, but before embarking on further graduate study beyond the initial 6 credit hours, an official copy of previous college transcripts must be submitted.

Several programs of a highly competitive nature have early deadlines. Failure to submit a "complete" application by the program's established deadline date will result in removal of the application from consideration for admission. Applications that remain incomplete for 6 months after the initial

deadline will be purged unless the student requests deferment to a subsequent semester.

Application may be made to only one graduate program at a time. No provision is made at Old Dominion University for dual-program graduate study.

Applicants should refer to admissions.odu.edu or the paper application for program application deadlines.

The Admission Decision

A written notice from the Office of Admissions or International Admissions, not letters from departments or faculty members, is certification of admission. Admission to graduate study may be limited by the number of places available in the various programs, colleges, schools, and departments of the University. Applicants are encouraged to apply early. The application process may span six to eight weeks depending on timely receipt of documents. After supporting credentials have been received and reviewed, applicants for admission are usually notified within 30 days of the action taken on their application.

International Student Admission

All international applicants (Undergraduate, Graduate or Non-degree) seeking or holding a non-immigrant visa should apply through the Office of International Admissions. Applicants can apply online or via the paper application, which is available as either a pdf or hard copy by request. Along with the application and fee, official academic records and evidence of English language proficiency (if the applicant's native language is not English) must be submitted.

Academic decisions regarding University admission are determined without bias to personal or family finances; however, a student will be unable to maintain or obtain a student visa without adequate financial support. Sufficient funding must be demonstrated to both Old Dominion University and the U.S. consulate. Funding includes tuition and living expenses for the first year of study in addition to a reasonable expectation of funding for the remaining years. Old Dominion University issues forms I-20 (F-1) or DS-2019 (J-1) for the nine-month academic year.

Photocopies, notarized copies, or faxed copies of required official documents will not be accepted. Certified translations by a licensed or professional translator must accompany academic documents not written in English. Translations of official documents completed by the student will not be accepted.

Additional information required by graduate departments is specified in the International Graduate Application. All applicants, undergraduate and graduate, should read the application prior to applying to insure they understand the admissions process. Following the application instructions will ensure a prompt admission decision.

Applicants outside the United States are recommended to apply to Old Dominion University six to eight months prior to their desired date of enrollment to allow time for the exchange of correspondence, evaluation of all necessary documents, and the settling of financial, immigration, and housing matters. Application and credential deadlines are as follows:

Term of Entry	Application/Credentials Deadline
Fall Priority (August)	February 15
Fall Final (August)	April 15
Spring (January)	October 1
Summer (May)	February 1

All new international students are required to attend International Orientation, which precedes each fall and spring registration. Organized by the Office of International Student & Scholar Services (ISSS), the program gives students information critical to maintaining their non-immigrant status, in addition to an overview of campus life and services, employment/internship opportunities and general cultural adjustment.

All admissions correspondence such as applications, academic records, financial documents, examination results, translations, and course descriptions are to be addressed to:

The Office of International Admissions
Old Dominion University
129 Koch Hall
Norfolk, Virginia, USA 23529

Tel: (757) 683-3701

Fax: (757) 683-3651

E-mail: intladm@odu.edu

Web site: <http://admissions.odu.edu/international>

English Proficiency Requirements for Non-Native Speakers of English

Admission to the University is contingent upon successful completion of English language proficiency requirements. Non-native speakers of English can provide evidence of English language proficiency through a variety of options. Please note that Bridge Program students, undergraduate and graduate, must satisfy English proficiency requirements within twelve months from their enrollment in the program. Also, an application to the English Language Center and subsequent enrollment in English language courses at the Center does not imply admission to the University. English language courses are noncredit. Further information for non-native speakers of English is available from the Office of Admissions (permanent residents and naturalized citizens) and from the Office of International Admissions (all non-immigrants).

Fulfillment of any one of the following will satisfy English language proficiency requirements for admission to Old Dominion University:

1. Graduate applicants who are non-native speakers of English must provide evidence of English language proficiency through fulfillment of one of the following:
2. Submission of a TOEFL score of 550 or CBT of 213, a GRE verbal score of 480, an IELTS overall band of 6.5, a CPE grade of A, B, C.
3. Possession of a bachelor's or master's degree from an accredited institution located in a country where English is the native language.
4. Successful completion of the Graduate Bridge Program.

Graduate students who choose to satisfy English language proficiency requirements through the Graduate Bridge Program will be placed according to the following criteria:

1. Students with TOEFL scores below 500 or CBT scores below 173 will be placed in a full-time English language program.
2. Students with TOEFL scores below 550 but above 500 or CBT scores below 213 but above 173 will be placed in a comprehensive Graduate Bridge Program including academic course work (one graduate course) and semi-intensive English language courses (seven hours). Students will be considered as having satisfied English language requirements when they have successfully completed two semesters in this program. Attendance in the seven-week Summer Graduate Bridge Program can count as one semester. Successful completion is defined as a minimum grade of B in each graduate academic course and in English language courses. No student will receive a grade of A or B in English language courses without demonstrating 85% attendance.

Also, non-native speakers of English who anticipate holding a teaching assistantship position must provide evidence of oral English proficiency. They may take the Test of Spoken English (TSE), given by the Educational Testing Service (ETS) at sites around the world, or the ETS SPEAK Test, administered by the English Language Center at Old Dominion University. Graduate teaching assistants who fail to pass either of these tests will not be eligible to assume an instructional position.

Deferments

International students are eligible to defer their admission or application for up to one academic year beyond the original term of entry via the online international deferment request. Requests beyond this allotted time will require the student to re-apply with transcripts and application fee. **Students in F/J status must submit updated financial documents and return all unused I-20 or DS-2019 forms to International Admissions.**

Distance Learning/ TELETECHNET Admission

Students who are applying for a distance learning program are encouraged to apply on-line and include their essay and resume. Students may request letters of recommendation within the on-line application and the recommendation letters can either be mailed or sent electronically to the Office of Admissions. Paper applications are available and may be submitted to the local Distance Learning location or mailed to the Office of Admissions. All graduate applications are processed according to the University policies and procedures contained in this catalog.

Types of Admission Status

Degree Seeking Applicants

Regular. Students who have fully met the requirements for admission to a program.

Provisional. An applicant who does not fully meet the requirements for admission as a regular graduate student may, at the discretion of the graduate program director, be allowed to enroll in a graduate program as a provisional graduate student. This is normally a temporary status, which will be changed by the graduate program director to that of regular status when the student has fulfilled all the terms and conditions detailed in the offer of provisional admission. The change in status ordinarily will take place after the completion of at least 12 hours of graduate course work in which the student has earned the average grade of B (3.00) or better and upon completion of any prerequisite work. Previous non-degree credits earned may not be included for purposes of satisfying the provisional 12-hour requirement. No student with less than a 3.00 average will be granted regular status. Should a provisionally admitted graduate student not qualify for regular status at this time, the student may request non-degree status. Provisional students placed in non-degree status must reapply for admission to a degree-seeking program. The Regulations for Continuance section of this Catalog applies to both provisional and non-degree students. Credits earned as a provisional student may be applied toward the fulfillment of degree requirements. Credit earned while in non-degree status is subject to the limitations described below for non-degree admission.

Deferred Enrollment. With approval of the graduate program director, enrollment into a graduate program can be deferred for no more than 1 calendar year beyond the start of the original semester for which admission was offered. For example, students offered admission for fall may request to defer their enrollment to the next fall semester. The records of students who have not enrolled after 1 calendar year will be purged and students will have to reapply for admission.

Nondegree Entry

Nondegree entry is available to students who do not choose to apply for admission to a degree program at the time but wish to enroll in course work at the institution. Some reasons to enter as a nondegree student are:

- Visiting student – A student who takes course work at Old Dominion University and then transfers the course credit to the home (degree-granting) institution.
- Applying for a certificate program.
- Expanding academic background or teacher certification.
- Taking courses for personal and/or academic growth.
- Missed the application deadline, but intends to apply as a degree-seeking student for a successive term.
- Taking prerequisites (undergraduate, second degree or graduate) for a degree-seeking program.
- Senior scholars – High school students taking college-level courses (permission is needed from an admissions counselor).

Nondegree Entry Procedures

Applicants for nondegree status are required to complete the application form found on the Registrar's Office website at www.odu.edu/registrar or on the Admissions Office web page. For the student's convenience, official credentials may not be required at the time of registration; however, unofficial records or a personal interview may be requested for admission purposes. It is understood that all student information stated on the application is truthful. Deliberate falsification of application information will result in immediate withdrawal and a potential forfeiture of credits. Students should be familiar with policies and procedures for nondegree enrollment listed on the application form.

Directions for Certificate Program Registration

Please contact the department offering the certificate program for specific registration information and procedures.

Additional Information

- All students should seek the approval of the academic department before registering for course work as a nondegree student.

- Financial aid is not available for nondegree students, except those in approved teacher certification programs.
- Students under suspension from another college or university are not eligible to attend as nondegree.
- Academic advising is not available to nondegree students, but students are strongly encouraged to contact their academic department before registering for courses.
- All students, degree and nondegree alike, must meet the continuance requirements as stated in the current Graduate Catalog. Failure to meet these requirements will subject students to probation or suspension.

Continuing Student Admission

Continuing applicants are students who have previously attended Old Dominion University on a degree-seeking basis and left the University, but would like to return. A student who has left the University in good academic standing is required to complete a reactivation/readmission form. If the separation from the University was longer than five years, the applicant will be required to reapply and resubmit all official transcripts and necessary credentials.

Graduate Registration Requirements and Procedures

Office of the University Registrar

The Office of the University Registrar provides a wide variety of student services, including registration, verification of enrollment, maintenance of student records and academic history, transcripts, degree certification and diplomas. Self-service is available online at www.leonline.odu.edu. A calendar of important dates, the examination schedule, and information about various policies and procedures is available at www.odu.edu/registrar.

The Office of the University Registrar also is responsible for determining in-state tuition status, athletic eligibility and registration of students enrolling through the Virginia Tidewater Consortium and the Interinstitutional Study Program with Norfolk State University.

Finally, the Office of the University Registrar provides service to military veterans who are attending the University by processing Veterans Affairs paperwork. Complete information is available to veterans on the Registrar's Office website as well as on the Veterans Administration website www.gibill.va.gov.

On the Norfolk campus, services are available at the office in 116 Alfred B. Rollins, Jr. Hall. Additionally, many services are available at the higher education centers and the distance learning sites located throughout the Commonwealth of Virginia. The office is open Monday-Friday from 8 a.m.-5 p.m. and can be reached at 757-683-4425.

Registration

There are several registration options available to students: registration via the web at www.leonline.odu.edu, in person, on-campus registration, and off-campus registration.

Eligible students are encouraged to preregister in order to improve the likelihood of obtaining satisfactory schedules of classes. Preregistration is reserved for currently enrolled degree-seeking students. Eligible students will be assigned a "time ticket" four to six weeks prior to preregistration. Open registration begins immediately following the preregistration period.

Complete registration information, important deadlines and the final examination schedule can be found at www.odu.edu/registrar. The course schedule is available at www.leonline.odu.edu by March 7 for summer and fall semester classes and by October 7 for spring semester classes.

Academic Calendar and Course Scheduling

The academic calendar consists of fall semester, which begins one week prior to Labor Day Weekend, and ends 16 weeks later. Classes will be held on Saturday and Sunday of Labor Day weekend, but classes are canceled for Labor Day. A Fall Break is scheduled for mid-October (Columbus Day Weekend) and runs from Saturday through Tuesday of that weekend. Thanksgiving break begins after classes on Tuesday prior to the holiday, and classes resume on the following Monday. Graduation is scheduled on the Saturday after exams have been administered.

Spring semester begins one week prior to the Martin Luther King holiday weekend. Classes are canceled for MLK weekend (Saturday-Monday) and resume on Tuesday following the holiday. Spring Break is scheduled eight weeks after the start of classes, from Monday through Saturday. Classes resume on the following Sunday and continue until Tuesday of week 15 into the semester, with the exception of Easter Sunday. A reading day is held the Wednesday after classes end, with exams beginning on Thursday and continuing to the following Thursday. Graduation is scheduled for the Saturday after exams have been administered.

Summer term is 14 weeks, with varying sessions allowing for course durations of one week, two weeks, and so on, up to 14-week timeframes. The term ends no later than mid-August.

Note: Asynchronous courses may or may not follow these terms. The University will determine the duration of each course, and students may opt for self-paced study, based on the concept of anytime/anyplace learning.

Authorization to Enroll in Graduate Courses

Degree Seeking Students

All students who have been admitted in regular or provisional status to graduate degree programs must have the advisor block lifted prior to registration each semester. Registration for graduate courses in engineering and business requires departmental approval. Students should consult with their advisors to discuss their program of study and to schedule appropriate courses in advance of registration whenever possible.

Nondegree Seeking Students

Nondegree graduate students should seek advice from the department/school offering the course, or, if registering for engineering or business courses, permission of the department/school.

All nondegree graduate students who have completed six credit hours of graduate courses will receive an "advisory" notice upon attempting to register for additional graduate courses. This notice will advise the student to contact the Office of Graduate Studies to obtain counseling and recommendations. This "advisory" notice will not prevent registration.

All nondegree graduate students attempting to register for additional graduate courses and who have completed or will exceed 12 credit hours (13 credit hours for certain military programs) will be blocked from registering. To remove this registration block, a student must contact the Office of Graduate Studies for advice on gaining admission into a graduate program or to receive written permission from the vice provost of graduate studies and research to take additional hours as a nondegree student.

Students taking graduate courses for licensure, certification or professional development (e.g., Virginia Department of Education "endorsements") will not receive the advisory notice and will be exempt from the registration block. Contact the department offering the affiliate program for specific registration information and procedures.

Students should consult the Registrar's Office website at www.odu.edu/registrar each semester for the most current advising and registration policies.

Audit Status

The audit grading status is available for students who would like to enroll in a course for the knowledge gained or personal satisfaction, not for academic credit. Any course that is elected to be carried as an audit will be subject to the normal fees and regulations of the University. Regular attendance is expected, but neither tests nor examinations are required. No grade will be recorded, except that an instructor may assign a grade of W& to a student who misses an appreciable portion of the classes. The student's record will be marked "audit" by the course so elected. A student may not audit a course and subsequently seek advanced placement credit for the same course. A student may audit a course and register for the same course for credit in a subsequent semester. Any course elected for audit cannot be changed to that of credit status after the end of the "add" registration period. Registration for the audit option must be selected by the end of the drop/add period in the given semester. Students receiving financial aid should be aware that registering for audit status may affect their financial aid eligibility. Selection of the audit status is accomplished through the normal registration procedures.

Course Numbering (Graduate Level)

Courses at the 500, 600, 700, and 800 levels are exclusively for graduate credit. Courses at the 500 level are available for graduate credit only and correspond to undergraduate 400-level courses. However, a different grading scale is used for 500-level registrants; additional and higher quality work is required in 500-level courses.

Topics course numbers include 195, 196, 295, 296, 395, 396, 495, 496, 595, 596, 695, 696, 795, 796, 895, and 896. These numbers are to be used to designate topics courses taught as a class. These courses should be shown in the course schedule with a section designation and room assignment. The particular topic for that semester should also be listed. Where a particular topic is offered more than two or three times, it should be approved as a regular course offering and given its own course number.

Individual and Tutorial course numbers include 397, 398, 497, 498, 597, 697, and 897. These numbers are to be used to designate courses involving individual or tutorial study within a discipline. These individually arranged

courses will require prior approval by the department chair and/or instructor, and will be shown in the course schedule with the designation “TBA.”

Cooperative Education course numbers are 367, 667, and 867.

Internship course numbers are 368, 668, and 868.

Practicum course numbers are 369, 669, and 869.

Seminar, Colloquium, and Capstone course numbers include 690, 691, 692, 693, 890, 891, 892 and 893.

Research/Project course numbers are 698 for the master’s level and 898 for the doctoral level.

The Thesis course number is 699 and is reserved for the master’s thesis.

The Dissertation course number is 899 and is reserved for doctoral dissertation courses.

The Continuous Enrollment course number 999 is available for the purpose of maintaining active status at the doctoral level. This may be a discipline-specific 999 course or GRAD 999.

whose requests for I grades are approved must not re-register for the class until the I grade has been resolved. The I grade becomes an F if not removed through the last day of classes of the following term (excluding the exam period) according to the following schedule: I grades from the fall semester become F’s if not removed by the last day of classes of the spring semester; I grades from the spring semester and the summer session become F’s if not removed by the last day of classes of the fall semester. An I grade may be changed to a W only in very unusual circumstances and when the student’s situation has changed since the I grade was awarded. In these cases, the request for a change to a W must be in writing, documented, and approved by the instructor, department chair and dean. Students will not be allowed to graduate until all grades of I have been resolved.

In the case of courses that do not fit within the traditional semester calendar, the faculty member assigns the I grade. The time periods for the removal of I grades before they become grades of F are the same as those stated in the previous paragraph.

Extension of the I time limitation normally will not be approved except for reasons beyond the student’s control and only if the supervising faculty member is available and willing to supervise the work beyond the normal time limit. Students should submit the request to the instructor, who should submit approval, via the chair, to the University Registrar in order to retain the I. The approval from the instructor should designate the expiration date of the extension.

A grade of II indicates incomplete work not subject to the time limits described above for I grades. The II grade can be used only in those courses directly related to the research for and preparation of the graduate thesis/dissertation.

Z Grades. A grade of Z indicates that no grade has been reported by the instructor and will convert to a grade of F if not removed through the last day of classes of the following term (excluding the exam period) according to the following schedule: Z grades from the fall semester become F’s if not removed by the last day of classes of the spring semester; Z grades from the spring semester and the summer session become F’s if not removed by the last day of classes of the fall semester. Students will not be allowed to graduate until all grades of Z have been resolved.

Interim Academic Evaluation. Faculty teaching 100- and 200-level undergraduate courses will provide specific feedback regarding progress in the course by posting an interim grade via Leo Online by the beginning of the fifth week of classes in the fall and spring semesters. Providing timely information to students on graded work makes students aware of their performance so they can determine whether to seek additional help from the faculty member, tutorial services when available, their academic advisor and/or withdraw from the course prior to the established deadline for withdrawal.

Mid-Semester Feedback. The University believes that regular assessment of students and feedback to them is essential to effective teaching and learning. Therefore, faculty members will provide all students with evaluation of their progress in a course prior to midsemester (or equivalent in a nonsemester course) so that students have information about their progress before the withdrawal deadline, which is the end of the tenth week of classes.

System of Grading

Grade	Grade Points	Undergraduate	Graduate
A	4.00	Superior	Excellent
A-	3.70	Superior	Excellent
B+	3.30	Good	Good
B	3.00	Good	Good
B-	2.70	Good	Fair
C+	2.30	Satisfactory	Poor
C	2.00	Satisfactory	Poor
C-	1.70	Passing	Poor
D+	1.30	Passing	Not Used
D	1.00	Passing	Not Used
D-	0.70	Passing	Not Used
F	0.00	Failing	Unsatisfactory
WF	0.00	Unofficial Withdrawal	Unofficial Withdrawal
P	None	Pass	See below
F(P/F)	None	Fail	See below
O	None	Audit	
I	None	Incomplete	
II	None	Incomplete not Subject to Time Limit	
W	None	Official Withdrawal	
Q	None	Progress but not Proficiency	
Z	None	No Grade Reported	

The use of plus and minus grades is at the discretion of the instructor.

The grade point average is calculated by dividing the accumulated number of grade points earned by the accumulated number of credit hours attempted. Grades of F and WF and repeats are included, but official withdrawals, audits, and grades on noncredit courses, nondegree credit courses, and pass/fail degree courses are not included.

For graduation, an undergraduate student must have a minimum grade average of C (grade point average of 2.00) in all courses taken and a grade point average of at least 2.00 in the major except for those programs requiring grade point averages above a 2.00.

A 3.00 average will be required for the awarding of a graduate degree or certificate. A student whose average falls below 3.00 following six or more graduate hours attempted shall be placed on probation or suspended in accordance with the continuance regulations for graduate students.

Grades in courses accepted for transfer credit are not counted in the computation of grade point averages.

Grades are available to students through the secure website. Grades are mailed to students only if a written request is submitted to the Office of the University Registrar.

WF and W Grades. The grades of WF and W indicate withdrawal from a course only under those conditions described in the sections entitled Class Schedule Change Procedure and Grading Policy for Withdrawal From Classes.

Incomplete Grades. A grade of I indicates assigned work yet to be completed in a given course or absence from the final examination and is assigned only upon instructor approval of a student request. The I grade may be awarded only in exceptional circumstances beyond the student’s control, such as illness, and only after 80% of the time allocated for the course has elapsed and substantial progress has been made toward completion of course requirements with the exception of courses that do not fit within the traditional semester calendar. In cases of exceptional circumstances beyond the student’s control, it is the responsibility of the student to approach the instructor to request an I grade and to provide documentation, including a written statement of when the work will be completed, to support the request. The authority to award an I grade rests with the instructor whose decision is final. Students

Dropping, Adding and Withdrawing From Classes

See the academic calendar in this Catalog or the Registrar’s Office website at www.odu.edu/registrar for deadlines for adding or dropping classes. For information regarding the refund schedule, see the chapter on Financial Information or go to the Office of Finance’s web page.

Class Schedule Changes and Drop/Add Procedures

Students may drop classes within the first seven calendar days after classes have started and may add classes up to 11 calendar days after classes have started (for full semester classes).

Once registered, a student must drop or add classes via the secure website at www.leonline.odu.edu or submit a completed drop/add form to the Office of the University Registrar or to the distance site office (for TELETECHNET students). The date the form is received in the Office of the University Registrar, the distance site office or processed via LEO determines tuition adjustments, if applicable. Drop/add forms, if needed, can be downloaded from the Registrar’s Office website: www.odu.edu/registrar. Forms are also available from the student’s advisor, department chair, dean, or the distance site office (for TELETECHNET students).

Signatures of advisors are required for freshmen adding courses. Students enrolled in degree programs in which sequencing is critical are urged to consult their academic advisors before scheduling changes. In such programs, dropping of courses without prior consultation with academic advisors may necessitate additional time to complete University and/or departmental degree requirements.

See the academic calendar in this Catalog or www.odu.edu/registrar and click on the link to “calendars” for the dates for adding or dropping classes. For information regarding the refund schedule, see the chapter on Financial Information or go to the Office of Finance’s web page.

Summer Sessions

Old Dominion University offers a 14-week summer program, including two four-week sessions, two six-week sessions, two seven-week sessions, and one 14-week session, starting in the middle of May and ending in the middle of August. The exact dates are listed on the Registrar’s Office website at www.odu.edu/registrar. More than 1,250 graduate and undergraduate classes are offered on campus and off campus during the summer months

Withdrawal From Classes or From the University

Policy for Dropping and Withdrawing From Classes

Dropping Classes. Prior to the start of and during the first seven calendar days of the semester, a student may drop a course; this means no grade will be assigned and no reference entered on the student’s permanent academic record. Please refer to www.odu.edu/registrar and click on the link to “calendars” for the dates to drop classes in nonsemester courses.

Withdrawal from Classes. After the first seven calendar days of the semester, a student may withdraw from any course through the end of the tenth week of a regular semester. Please refer to www.odu.edu/registrar and click on the link to “calendars” for the dates to withdraw from classes in nonsemester courses. A grade of W will be assigned during this period. Students who withdraw through the end of the tenth week are encouraged to contact their instructor, advisor, site director, or distance learning representative, and financial aid counselor to discuss the implications of withdrawing.

Withdrawal from a course after the tenth week of a regular session (or its equivalent in a nonsemester course) is usually not permitted. However, in the event of an illness or other severe hardship beyond the student’s control, the student should submit, no later than the last day of classes, a written petition for permission to withdraw to the instructor and the chair of the department offering the course. If permission is granted by both, a grade of W will be recorded. If permission is not granted by both, the student will not be allowed to withdraw from the course. Any appeal of decisions should be brought to the dean of the college offering the course.

A student who stops attending classes without withdrawing from the course will receive a grade of WF, except if the student’s performance was an F at the time the student stopped attending class, in which case a grade of F will be assigned. The grade of WF will carry no grade points, and will be computed in the grade point average as a grade of F.

Drop and Withdrawal Deadlines. Specific deadline dates for dropping and withdrawing from classes are found at the Registrar’s Office website, www.odu.edu/registrar, by clicking on the link to “calendars”

Administrative Withdrawal From the University

During the course of any semester, there will be situations, such as severe illness, death in the immediate family, or disciplinary actions, which will require that the University initiate an administrative withdrawal from the University to assist a student or to implement a University-imposed sanction. The following procedures will be used.

1. The request for withdrawal is initiated either by the student because of an extenuating personal situation or by the University because of a disciplinary situation.
2. This action will normally be handled by the Vice President for Student Affairs or designee. If the student initiates the withdrawal, the Vice President for Student Affairs office will determine what verification is necessary and document the situation.
3. A request will be submitted to the Office of the University Registrar to withdraw the student from all classes.
4. The student’s instructors will be notified. If the student is withdrawing after the last day to withdraw from classes without

penalty, part of this notification will include the opportunity for the faculty member to raise objections if the student’s classroom performance is such that a withdrawal (W) would not be appropriate. If a faculty member objects, the faculty member will inform the University Registrar and the student will receive an “F” in the class.

5. The request for withdrawal must be initiated by the student within one calendar year counting from the first day of classes of the term for which administrative withdrawal is sought. Requests for withdrawal that have the necessary documentation but are received after the one-year deadline may be reviewed by an appeals committee consisting of at least three members and including both faculty and administrators, to be convened by the Student Ombudsperson in Student Affairs. These requests must also include clear and convincing evidence explaining the student’s inability to submit the request within one calendar year. Students submitting requests after the one-year deadline are not eligible for a tuition appeal.
6. Tuition refund appeals are handled separately and must be submitted to the Office of Finance.
7. Students receiving financial aid should consult their financial aid counselor prior to submitting a tuition refund appeal.

Exceptions to Normal Policies and Procedures Due to Military Mobilizations

Statement: Due to possible military mobilizations and their subsequent impact on Old Dominion University students, the University will grant the following exceptions to normal policies and procedures when registered students are called up for active duty military service.

- All active duty military students who are unable to complete course requirements due to change in employment duties, work schedule or deployment to a duty assignment may be administratively withdrawn from current semester courses. Students are required to furnish a copy of their military orders to the Office of the University Registrar.
- All students unable to attend classes due to security restrictions imposed at military sites, or who are unable to attend classes at an alternative offering provided by the University, may be administratively withdrawn. Students are required to make a written request to the site director who will certify the circumstances and report the request to the Office of the University Registrar.

The Office of the University Registrar will maintain records of administrative withdrawals performed under this policy.

Students who are administratively withdrawn from the University under this policy are strongly encouraged to maintain contact with the University through the Office of the Dean of Students. Returning students should contact the Office of Admissions to verify their student status and to reactivate their records, if necessary, prior to re-enrolling in classes.

Guidelines and Procedures for Grade Adjustments for Nonacademic Reasons

1. Errors in the assignment of grades (e.g., a C received instead of an A) must be brought to the attention of the faculty member immediately upon receipt of the grade. If confirmed, the instructor will submit a grade change through the chair to the University Registrar. An online process for grade changes is available if the grade to be changed is not older than two semesters. In these cases, the instructor of record makes the change online. The chair is notified by email of the change and may at that time deny the change of grade. If the grade to be changed is older than two semesters, then the instructor submits an Academic Record Change Form (H-1002) to the chair, who forwards it to the University Registrar if it is approved, and notifies the instructor of reasons for denial if it is not approved.
2. Administrative errors (e.g., drop/add submitted but not processed) should be brought to the attention of the University Registrar immediately upon receipt of the grade.

Grade Appeal Procedure

1. The purpose of the grade appeal procedure is to serve the needs of graduate and undergraduate students who believe that they were unjustly awarded a final course grade by a faculty member through prejudice or caprice. This policy applies to the final grade for the

- award of academic credit and does not apply to graduate and undergraduate examinations that are administered as part of the degree progression and certification processes (such as comprehensive examinations and candidacy examinations at the graduate level). The basis for a grade appeal is the student's charge that the final grade was awarded through prejudice or caprice. The burden of proof rests with the student.
2. Students must initiate the appeal within the same time limitations that exist for removing a grade of I from a record (see the policy on System of Grading).
 3. The student will consult with the instructor first for an explanation of the method of evaluation and to determine whether an error has been made.
 4. If the student is not satisfied with the results of the conference with the instructor and the student wishes to pursue the appeal, the case must be presented in writing for a first-level appeal. The student's grade appeal letter should (1) state specific reasons and give examples of faculty prejudice or caprice, (2) show that prejudice or caprice affected the awarding of the final course grade, and (3) be presented as a complete package and include all supporting documentation.
 - A. The student will submit the grade appeal letter to the chair of the department.
 - B. If the instructor is the chair, the student will submit the grade appeal letter to the dean.
 - C. If the instructor is the dean, the student will submit the grade appeal letter to the chair of the department in which the dean is teaching the course.
 5. If it is concluded at the first-level appeal that there is no cause for complaint, the person to whom the appeal was submitted will notify the student in writing that the appeal is denied. The student may submit a second-level appeal as detailed below.
 - A. If the chair initially concludes in the first-level appeal that there is no cause for complaint, the student has the right to appeal to the dean. The student should request in writing that the chair forward the grade appeal package to the dean to initiate the second-level appeal.
 - B. If the instructor is the chair and the student has appealed directly to the dean and the dean concludes in the first-level appeal that there is no cause for complaint, the student has the right to appeal to the provost and vice president for academic affairs. The student should request in writing that the dean forward the grade appeal package to the provost and vice president for academic affairs to initiate the second-level appeal.
 - C. If the instructor is the dean and the student has appealed to the chair of the department in which the dean is teaching the course and the chair has concluded in the first-level appeal that there is no cause for complaint, the student has the right to appeal to the provost and vice president for academic affairs. The student should request in writing that the chair forward the grade appeal package to the provost and vice president for academic affairs to initiate the second-level appeal.
 6. If the person to whom the second-level appeal is submitted concludes that there is no cause for complaint, the student will be notified in writing that the grade appeal process is complete and no further appeal is allowed.
 7. If during the first- or second-level appeal process it is concluded that there may be valid cause for the complaint, the person to whom the appeal has been submitted should consult with the instructor and student and attempt to mediate the dispute. Among the alternatives available for resolution of the case will be the assignment of the grade of P if the chair, the instructor, and the student express their agreement in writing. If mediation fails, the person to whom the appeal has been submitted will offer to form a committee to carry out an independent investigation and a hearing will be held.
 - A. The person to whom the appeal has been submitted will appoint a committee from the department or college. The committee will consist of two faculty and one student. Both the instructor and the student will have the right to challenge, for valid cause, any or all of the members of the committee, and in that event replacements will be appointed and no further challenge will be permitted. The committee will hear the instructor, the student, and other pertinent witnesses. The hearing will be taped, but the tapes will be erased after one year following disposition of the case. The committee, after careful deliberation, will make its recommendation to the person to whom the appeal was

submitted, who will relay the information to the instructor and the student.

- B. If the committee finds that there is no cause for complaint, the grade appeal process is complete and no further appeal on the merits of the case is allowed. Only one hearing on the merits of the case is allowed.
- C. If the committee finds on behalf of the student and recommends a change of grade and the instructor refuses to change the grade, then the person to whom the appeal was submitted will consult with the student about the advisability of accepting a P grade. Should the student consent to acceptance of a P grade, the person to whom the appeal was submitted is authorized to change the contested grade and will so inform the registrar. A P grade established under this policy will be given irrespective of the University policy on hours permitted for P grades or restrictions on when a P grade is permissible and will not prevent progression in the degree program or courses for which this course is a prerequisite.
- D. If either the instructor or the student believes that the established procedures for the appeal of grades have not been followed, an appeal for a rehearing may be to the person identified as the second level of appeal. The only basis for appeal will be the failure to have been provided due process as prescribed by the policy.

Transcripts

Transcripts are provided by the Office of the University Registrar and are issued only upon the written request of the student or upon submission through the secure website at www.leonline.edu.edu (click on link to student records and then transcripts). They should be requested at least five business days before the date needed to allow for processing and delivery. Students picking up transcripts must present valid identification.

No transcripts will be issued if the student has an outstanding debt at the University. All grades, academic standing, degrees received, and degree honors are included on the transcript.

An official transcript carries the University Seal and an authorized signature. Official transcripts are usually mailed directly to educational institutions, employers, etc. Any transcript mailed to or given directly to a student will be marked, "Issued to Student." Partial transcripts are not issued; each transcript must include the student's complete record at Old Dominion University. A transcript of work completed at any high school or at any college other than Old Dominion University must be obtained directly from that institution.

There is a charge of \$5.00 for each transcript issued. Additional fees are charged for expedited delivery services. Students may access and print unofficial transcripts for personal use through www.leonline.edu.edu at no charge.

Graduation Information

All students must apply for graduation during the semester prior to the expected completion of degree requirements. The deadline to file the intent to graduate is generally the last day of November, February and June for the following semester. Specific deadlines are published on the Registrar's Office website, www.odu.edu/registrar.

Students can view their application and degree status in LEO Online, www.leonline.edu.edu. Once the application has been processed, the student's graduation status appears as "pending." The status changes to "awarded" once the degree is conferred. At peak times, coding can take up to four weeks following submission of the application.

Applications, complete instructions and deadlines regarding graduation are available on the Registrar's Office website. A separate application for each degree is required if the student is pursuing more than one degree.

Students who do not complete degree requirements as expected must reapply for the next graduation date.

Application for Graduation for Graduate Students

Graduate students should download the application for graduation from the Registrar's Office website and submit the completed paperwork directly to the Registrar's Office. Graduation staff members will coordinate the evaluation process with the appropriate graduate program advisor.

All outstanding work, incomplete and unreported grades must be completed or resolved before the degree will be conferred. Master's level and doctoral students must have submitted the thesis (if required) or dissertation to

the Registrar's Office no later than the last day of classes as well as evidence of successful completion of oral, written or other degree requirements. Graduate students should confer with the graduate program director and review materials available on the Office of Graduate Studies website for complete information (www.odu.edu/graduatestudies).

Commencement

Commencement exercises are intended for students who are eligible and reasonably expect to complete degree requirements, graduating from the University within the current or next graduation period.

Commencement ceremonies are managed through the Office of University Events. Information about requirements for participation in commencement ceremonies, the on-line application process for tickets, academic regalia, schedule of events, etc., will be posted to www.odu.edu/commencement. To be eligible to participate in ceremonies, candidates must register for commencement ceremonies according to deadlines posted by the Office of University Events.

Participation in May commencement ceremonies is limited to candidates for May graduation and students who expect to complete studies in the upcoming August. Participation in December commencement ceremonies is limited to candidates for December graduation and graduates from the preceding August.

Students who expect to attend commencement ceremonies must be coded by the Registrar's Office as "pending" for graduation; otherwise, tickets will not be provided by the Commencement Office. With the exception of doctoral candidates, all students participating in commencement ceremonies remain pending for graduation until the record is evaluated and the degree is conferred, up to four weeks, excluding University holidays, following the date of the commencement ceremony.

Participation in commencement ceremonies does not confirm that a degree has been (or will be) conferred.

Diplomas

Diplomas are mailed to the student's permanent address after the degree has been posted. Mailing will begin at about the fourth week following the commencement ceremony, excluding University holidays, and continue until all diplomas have been distributed. All holds, debts or other obligations to the University must be satisfied before the diploma will be released. Information about holds can be viewed at www.leonline.odu.edu.

The student's legal name (as maintained in the student system) and the degree title appear on the diploma. For a complete listing of degrees, please refer to the "Synopsis of Degree Programs" in this catalog.

Interinstitutional Agreements and Opportunities to Fulfill the Degree

Attendance at Other Institutions

Students who are enrolled at Old Dominion University may attend another institution and transfer credit earned there back to a degree program at Old Dominion University. While formal Old Dominion University permission is not required, students should consult the academic advisor to ensure that the credits to be taken at the other institution will transfer to the Old Dominion University program in which the student is enrolled. A complete list of transferable courses that have already been evaluated can be found on the web by searching for Monarch Transformation. If accepted and the student has earned at least a grade of "B," courses will appear on the Old Dominion University transcript as transfer credit and can be used for general education, major or minor requirements or elective credit. No grade points or hours are calculated into the Old Dominion University grade point average; only hours awarded count toward the total number of credits required for the degree. An official transcript from the other institution must be mailed directly to the Office of Admissions, 108 Rollins Hall, Norfolk, VA 23529, Attention: Transfer Coordinator.

The other institution may ask the student to provide documentation of good standing or eligibility to continue at Old Dominion. These forms should be submitted to the Office of the University Registrar. Forms that require the student to demonstrate that the course(s) will be accepted for transfer credit at Old Dominion University should be submitted directly to the academic advisor.

Academic Common Market

Old Dominion University, through a number of its undergraduate and graduate programs, participates in the Southern Regional Education Board's Academic Common Market. Eligible residents of participating states may enroll (following admission to degree status) as Academic Common Market students at in-state tuition rates. Evidence of legal domicile must be presented to the Office of the Registrar, Rollins Hall. Information on available programs may be obtained from the Office of Academic Affairs.

Interinstitutional Study Program with Norfolk State University

Old Dominion University students have the opportunity to elect courses at Norfolk State University through a student exchange program agreed to by the two institutions.

The registrar of each institution will register a student for courses at the other institution if the student presents a properly signed form listing the course or courses to be taken at the other institution. The student exchange will be honored both in the regular session and in the summer session and applies to both undergraduate and graduate students. All credits earned by students will be considered as resident credit at the home institution for degree purposes. (Courses taken at NSU under this policy will be considered the same as Old Dominion University courses; all other courses are subject to transfer credit policy limitations.)

Regular bus service is provided between campuses but is not available for evening classes.

Student Exchange Policy Between the College of William and Mary and Old Dominion University

The registrars at Old Dominion University and the College of William and Mary will each register students in all departments in the College of Sciences (Old Dominion) and the School of Marine Science (William and Mary) for courses at the other institution. If the student presents a properly signed form listing the course(s) to be taken at the other institution, the exchange will be honored in both regular sessions and in summer sessions, and will apply to graduate students at the master's, certificate of advanced study, and doctoral levels at both institutions.

The student must have completed prerequisites for the course(s) for which he/she registers. Core curriculum requirements must be met at the home institution. Elective courses and departmental requirements may be satisfied through exchange courses, but approval is required from the student's department. If a particular course is offered at the home institution, it may not be taken for credit at the other institution. All credits earned will be considered as resident credit at the home institution for degree purposes.

The tuition and fees are determined and retained by the student's home institution.

Student Exchange Policy Between Eastern Virginia Medical School and Old Dominion University

The registrars of Old Dominion University and Eastern Virginia Medical School (EVMS) will each register a student for courses at the other institution if the student presents a properly signed form listing the course(s) to be taken at the other institution. The exchange will be honored both in regular sessions and in summer sessions and will apply to graduate students at the master's and doctoral levels at both institutions. The students must have completed all prerequisites of the courses for which they register. All credit so earned will be considered as resident credit at the home institution for degree purposes. (Courses taken at EVMS under this policy will be considered the same as Old Dominion University courses; all other courses are subject to transfer credit policy limitations.)

Tuition and fees applicable to the courses taken will be handled according to current interinstitutional policies regulating these.

Navy Education Consortium and Educational Agreements

A consortium of higher education institutions, located near major naval facilities, has developed a means to enhance the opportunities for active duty naval officers to participate in graduate education at the master's level. The institutions are Old Dominion University, George Washington University, Memphis State University, The University of Rhode Island, San Diego State University and the University of West Florida. The program areas which may be offered under the auspices of the consortium include international and political studies, computer information sciences, and computer science. These higher education institutions also provide a common curriculum that satisfies

competency areas as set forth by the Navy for the ETMS program. Officers participating in the program are enrolled in the Master of Science in Education degree program with a major in educational administration. For current information, contact the Office of Academic Affairs.

Virginia Tidewater Consortium Exchange Program*

Old Dominion University students may also take courses at any of the following Consortium institutions: Christopher Newport University (Newport News), College of William and Mary (Williamsburg), Eastern Shore Community College (Melfa), Eastern Virginia Medical School (Norfolk), Hampton University (Hampton), Joint Forces Staff College (Norfolk), Norfolk State University, Paul D. Camp Community College (Franklin), Regent University (Virginia Beach), Thomas Nelson Community College (Hampton), Tidewater Community College (all campuses), and Virginia Wesleyan College (Norfolk).

Cross-registration is subject to the following regulations:

1. Cross-registration is limited to degree-seeking students with cumulative grade point averages of 3.00 or better.
2. Cross-registration credit is limited to 30 semester hours.
3. Cross-registration in major courses requires the permission of the department chair.
4. Cross-registration is limited to courses not available to students at the home institution during the current semester. Exceptions to this requirement must be made by the chair of the department offering the course.

For further information, contact the Office of the University Registrar, Alfred B. Rollins Jr. Hall.

*Policy under review. Graduate students must adhere to college/program requirements.

Tuition, Fees, and Financial Information

The tuition and fees outlined below have been approved for 2009-2010. Tuition and fees are always subject to change, and while the University is unable to notify each student individually of changes to fees, this information is widely publicized in the media on campus, locally, and statewide.

Tuition

As used by the University, the term tuition refers to a comprehensive fee which includes payment of instructional programs, academic services, student services and activities, recreational sports, and intercollegiate athletics. All fees are subject to approval and/or change by the Board of Visitors.

The comprehensive fee includes a student activity fee of \$89.52 per credit hour for the Norfolk campus courses and \$53.30 per credit hour for Higher Education Centers, TELETECHNET and off-campus courses to support student services programs, recreational sports, and intercollegiate athletics and a capital fee of \$10.00 per credit hour for out-of-state students.

Information related to the comprehensive tuition can be found on the website for the Office of Finance, www.odu.edu/af/finance/.

Comprehensive Tuition Per Semester—2009-10 Academic Year*

Fall, Spring and Summer	Virginia Resident	Non-Resident
Graduate		
Tuition and Fees—per credit hour	\$338.00	\$844.00
Teaching Assistant	\$338.00	\$338.00
Research Assistant	\$338.00	\$338.00
Clinical Psychology Joint Psy. D. Program		
Tuition—per semester, full-time rate	\$4,117.00	\$10,864.00
Health Service Fee—per semester		
Full-time graduate students (9 or more semester hours)—mandatory	\$60.00	\$60.00
Part-time graduate student (8 hours or fewer) and students taking all courses off campus—optional	\$60.00	\$60.00
Summer sessions, undergraduate and graduate students—optional	\$48.00	\$48.00
Transportation Fee—per semester (Mandatory for all students, fall and spring, taking on-campus courses)	\$50.00	\$50.00
General Service Fee—per semester (Mandatory for all students)	\$9.00	\$9.00
Asynchronous Nursing Program Tuition Rate	\$270.00	\$270.00
Higher Education Centers and Off-Campus Offerings within Hampton Roads:		
Graduate	\$338.00	\$844.00
TELETECHNET and Off-Campus (Outside Hampton Roads):		
Graduate	\$338.00	\$844.00
TELETECHNET USA (Outside Virginia):		
Graduate	\$354.00	\$354.00

Students who are eligible to enroll in a combination of undergraduate and graduate courses in any given semester must pay tuition for the courses at the

appropriate levels as prescribed. Graduate hours are available at graduate tuition rates, and undergraduate rates apply for undergraduate hours.

Housing Charges—2009-10 Academic Year*

Rogers, Gresham, Whitehurst (room and board per year)	\$7,568.00
Powhatan I and II (room only per year)	\$5,026.00
Ireland, Virginia, Scotland House (room and board per year) (double room)	\$8,076.00

Applied Music Fees—2009-10 Academic Year*

Individual Instruction (2 or 3 credits, one hour of instruction)	\$250.00
Individual Instruction (1 credit, one-half hour of instruction)	\$175.00
Group Instruction (class piano or voice)	\$75.00

Laboratory Fees—2009-10 Academic Year*

BIOL 404, 420, 473, 504, 520, 573	\$25.00
BIOL 407, 507	\$100.00
CHEM 442W/542	\$100.00
ECE 407, 507	\$30.00
GEOG 402, 404, 502, 504	\$25.00
MLRS 501, 601	\$45.00
NURS 619, 658, 659, 660, 665, 672, 673, 674, 675, 764, 767	\$250.00
PT 627, 628, 826, 827	\$150.00

Nonrecurring Charges and Fees—2009-10 Academic Year*

Application Fee **	\$50.00
Late Penalty Fee	10% of past due amount
Payment Plan Processing Fee (nonrefundable)	\$40.00
Returned Check Processing Charge	\$20.00
Collection Fees	29.87%
Transcript Processing Charge (per copy)	\$ 5.00
Thesis, Dissertation Binding Service Charge	\$40.00
Additional Copies	\$16.50
Ph.D. Dissertation	
Microfilming	\$55.00
Copyrighting	\$65.00

Residency

To be considered a Virginia resident for tuition purposes for any given semester, it is necessary that the applicant be domiciled in the Commonwealth of Virginia for at least one year immediately preceding the beginning of that term. Domicile is a technical legal concept and is defined as the place (state) where a person resides with the unqualified intention of remaining indefinitely, with no present intention of leaving. Domicile is generally evidenced by such things as payment of income, real estate, and personal property taxes, voter and automobile registration, and driver's license. Residence in Virginia for the purpose of securing an education does not qualify a person for classification as a Virginia student for tuition purposes.

The General Assembly of Virginia has enacted several special provisions for active duty military, spouses and dependents. Please refer to www.odu.edu/registrar for current guidelines.

A student who meets the criteria for resident tuition during his or her course of study at Old Dominion University is not automatically reclassified to such status. He or she must request such classification, using an appeal form available from the Office of the University Registrar. By law, appeals of classifications must be submitted before the start of classes for the term in which a change is sought. Copies of the Virginia statute and guidelines issued by the State Council of Higher Education for Virginia are on reserve in the

* All fees are tentative and subject to final approval by the Board of Visitors and/or the President. Those listed are in effect as of 2009-10 and are subject to change.

** Does not apply to Old Dominion University full-time faculty and staff and their full-time dependents and former Old Dominion University students seeking readmission who have not attended another institution since leaving Old Dominion.

University Library and are available at www.schev.edu (search for “domicile”). Because of the length of those requirements, they are not printed in this catalog. Additional information may be obtained from the Office of the University Registrar.

Students who fail to complete the Tuition Rate Determination Form are classified at the out-of-state tuition rate.

Billing Cycle

Through the act of registration, either by registering online or by registration form, students accept responsibility for charges incurred. All University charges are due and payable by the established deadlines. The total amount due must be received by 5:00 p.m. on the deadline date shown on the statement to avoid financial penalties. Students unable to pay the total due may opt for participation in the University payment plan. If charges remain unpaid 30 days after the due date, a 10% late payment penalty is assessed. Once the account is 90 days past due, it is forwarded to a collection agency and assessed an additional 29.87%.

Billing Statements

The University sends debt notification by e-mail. It is the student’s responsibility to activate the ODU.EDU e-mail address issued to all admitted students. Please refer to Leo Online for specific types of notification covered. Approximately 30 days before the payment due date, advance billing statements for tuition and fees are sent to students who have preregistered. Students are expected to access account information through the secured access site on the web at www.leonline.odu.edu. Any student who registers or adds classes after any advance billing may be issued a statement by electronic mail during the next billing cycle, and charges will be subject to late payment fees. Failure to receive a reminder bill confirming charges does not waive the requirement to make payment when due, and financial penalties may accrue.

Failure to Pay Tuition

Students’ registrations will not be canceled for failure to pay tuition. Nonpayment will not release students from the financial obligation for tuition charges. Students are strongly encouraged to follow University procedures and meet published deadlines to officially drop classes and be released from charges. Stopping payment on a tuition draft does not constitute a cancellation of the student’s registration.

Payment/Cashiers Office

Students may pay for classes with personal checks, money orders, cash, or charge cards (VISA or MasterCard only). Cash payments should be made at the Cashiers Office ONLY. Payments may be mailed to Accounts Receivable/Cashiering, Old Dominion University, Alfred B. Rollins, Jr. Hall, Norfolk, VA 23529-0045. Personal checks will be accepted for the exact amount of fees and/or other amounts owed the University. Third party payments are accepted upon submission of authorization documents. Payments on all financial obligations to the University will be applied on the basis of age of the debt. The oldest debt will be paid first. Postdated checks are not scrutinized and will be deposited upon receipt. The Cashiers Office does not cash checks or make cash refunds. Checks must be provided in US dollars. Checks written in excess of assessed fees or other amounts paid the University will be accepted and processed, but the excess will be refunded to the student by mail at a later date.

Third-Party Payment Authorizations

The financial guarantee for payment of tuition and fees must be addressed specifically to Old Dominion University, Accounts Receivable, and printed on agency letterhead, purchase order, or voucher. Payments must be unconditionally guaranteed and made by the due date specified on the University’s invoice. Amendments to the financial guarantee are required in writing. Prior to the University processing authorizations, students may receive an individual billing statement. Students must provide the third-party billing authorization or government training voucher to the Office of Finance before the student’s individual payment due date. Failure to submit the authorization by the established deadline may result in a student billing, assessment of late fees and a financial hold on the student’s account. An agency with a past due balance may have billing privileges terminated. Sponsoring agencies and students being sponsored by these agencies should be aware that the student is ultimately responsible for any defaults in payments by the sponsoring agency. A student whose employer or sponsor

reimburses him or her for tuition after receipt of grades is not considered a third party. A student must pay in full upon registration or by the stated due date to avoid financial penalties. Contact the third-party billing coordinator for billing requirements or check the University web site.

Student Account Inquiry

The University reserves the right to request information on the student identification number and/or a photo identification when releasing information or conducting other financial transactions. Specific account information will be released only to the student. Each student account can be viewed using any Internet browser. Students are strongly encouraged to access records directly through their secure access site on www.leonline.odu.edu. Students are expected and required to assume responsibility for their own financial matters and to abide by the laws of the Commonwealth and the rules and regulations of the University. Failure to read and comply with University regulations will not exempt students from whatever penalties they may incur.

Delinquent Accounts

The University will not issue a degree, diploma, transcript of grades, grade report, or permit a registration for future terms to any student who has not paid all debts in full. Students with account holds are permitted to drop classes to reduce debt or withdraw to prevent academic penalty.

Collections

Virginia State law requires that the University make every attempt to collect past due amounts owed to state agencies. If, after 60 days, full payment of a debt has not been received, the account will be placed with a collection agency. Account holders are responsible for any collection costs incurred at a rate of 33.33% of the total due. Several other actions may be taken including the following: the account can be listed by the Credit Bureau as a bad debt; a delinquent account can be collected in full from income tax refunds, lottery winnings or other refunds due from the state (for Virginia residents); and the account may be turned over to the Virginia Attorney General’s Office for litigation. Timely payment is strongly encouraged so that collection efforts can be avoided.

Set-off Debt Collection Act

The University pursues debt in accordance with the guidelines set forth by the Commonwealth of Virginia in the Virginia Debt Collection Act. Under the provisions of this act, an individual’s Virginia income tax refund will be subject to the University’s claim for any unpaid balance of tuition and fees. Any communication disputing an amount owed must be submitted in writing to the accounts receivable manager, Alfred B. Rollins Jr. Hall.

Dishonored Checks and Charge Cards

A \$20.00 fee will be charged for each returned check or charge. If collection action is necessary, students will be liable for all collection agency costs. Stopping payment on a tuition draft does not constitute a cancellation of the student’s registration.

University Payment Plan (not available on past due balances)

The University offers a payment plan during fall and spring semesters ONLY. Payment plan agreements are administered by the Office of Finance and are established for a specified four-month period each semester (refer to the Office of Finance website). Payment plans are established on the student’s total charges for tuition and/or housing. There is a \$40.00 non-refundable processing fee to establish the plan each semester. Students must be in good standing with their student account to be eligible to participate. Payment plan forms are available on the University’s web site. Failure to pay on time may prevent students from using the payment plan process to defer payments in future terms. If any payment is 30 days past due, the entire payment plan balance will be due and payable. A 10% late penalty will be assessed on the entire balance if a payment is 30 days past due.

Tuition Refund Policy

The total tuition is considered fully earned by the University once scheduled classes have begun in any semester or summer session. Failure to attend the course after registering is not justification for elimination of charges.

For refund purposes, the beginning date of class is defined as the first official class date for the term. Students desiring to drop or withdraw from the University must formally notify the University using the official procedures set by the Office of the University Registrar. Refunds will be computed based on the actual withdrawal date certified by the Office of the University Registrar. Refunds will not be made to students who do not attend classes and have not completed the required withdrawal procedure. Refunds are issued by check for all payments, including credit cards. Please refer to the Office of Finance website at www.odu.edu/af/finance/ for refund dates.

Tuition Differentials

In accordance with the refund periods, a full or partial refund of the difference between tuition paid and the new tuition charges will be granted if the per credit rates differ. In those instances where the revised tuition charges are greater, the additional tuition charges will be assessed.

Drop and Add

No refund or additional tuition charges are assessed for students who drop and add an equal number of credit hours on the same day within the same semester/session if the per credit tuition rates are the same.

Special Situations

Administrative drops, as in the case of classes canceled by the University or the case of academically suspended students, entitle the student to a full refund of tuition.

Refund Policy on Financial Aid Funds

Federal regulations mandate the treatment of refunds for financial aid recipients. Financial aid funds are returned to the government when charges were paid by financial aid and a refund is given a student who fully withdraws from the University. Financial aid recipients may request more detailed information from the Financial Aid Office as federal refund guidelines are subject to change.

Tuition Appeal Policy

Students who must withdraw (with a grade of W or WF only) after the end of the refund period may appeal for a refund under the Tuition Appeal Policy. The purpose of the tuition appeal policy is to provide an opportunity for students to explain mitigating circumstances that prohibited them from course completion. All appeals are written and are reviewed by the Tuition Appeal Committee. The Tuition Appeal Committee may approve a refund or a release of financial aid under pre-approved conditions or recommend an exception. Committee decisions are final.

Students have the responsibility to submit an appeal within one year of the tuition due date for which charges are being appealed and to demonstrate compliance with the policy. Documentation is required, especially in cases of illness, death, and changes in employment shifts or military orders. Depending on the complexity of the appeal and the receipt of all supporting documentation, processing time on appeals can vary from two to four weeks.

Tuition appeals will generally be approved for the following reasons as long as the appropriate supporting documentation is provided: extended periods of physical illness, extended periods of physical or mental illness of the student's immediate family member, death of a student's immediate family member, mandatory job transfers outside of Hampton Roads or extended campus site, involuntary changes in employment schedule or military deployment, or a statement from the Office of Student Affairs authorizing an administrative withdrawal for medical reasons.

Students are strongly discouraged from submitting appeals that are based on lack of awareness of University policies and procedures, changes in personal circumstances or decisions, dissatisfaction with academic progress, or personal errors in judgment, including not attending class or the acceptance of new employment, as they will not be considered for approval. Issues related to the dissatisfaction with course content, delivery of instruction, or dissatisfaction with an advisor or instructor should be addressed with the chair of the academic department rather than through this appeal process.

Tuition appeal forms are available from the Office of Finance web site.

Employee Fee Waiver

Full-time faculty and staff registered for on-campus courses may have the transportation fee waived provided a faculty/staff parking decal has been purchased. Accounts are adjusted after the end of the drop/add period.

Senior Citizen Waivers

Free tuition for credit courses is available to senior citizens (persons 60 years of age or older who are residents of Virginia) who have a federal taxable income of less than \$15,000; if the person's taxable income exceeds \$15,000, the individual may only audit the course for free. Noncredit courses are free to all senior citizens. Senior citizens must pay other course-related fees such as applied music fees, lifetime sports fees, and other fees related to class materials. The senior citizen must meet the University's admission requirements. Enrollment in credit courses is available once classes begin. Enrollment in noncredit courses is on a space-available basis only after all tuition-paying students have been accommodated. Applications are available from the Office of the University Registrar and the University web site.

Perkins Loan Exit Interviews

The Perkins Loan Program requires that all recipients attend an exit interview before graduating, leaving the University, or attending less than half-time for the semester enrolled. During the interview session, the student is informed of his or her rights and responsibilities, including grace period, deferments and how they work, and cancellation privileges. Students are notified of exit interviews by mail. If a student fails to attend the exit interview or return the required materials, a hold is placed on the student's transcript and/or diploma until the University has received all the proper paperwork required to meet federal regulations. The Federal Direct Student Loan program is a distinctly separate loan program and has another exit process. For information on the Federal Direct Student Loan exit interviews, please contact the Office of Financial Aid.

Deferments

Old Dominion University offers two types of deferments: financial aid and veterans. A deferment is an extension of the payment deadline for tuition and housing charges for students whose financial aid funds or veterans' benefits are not available by the tuition deadline. Generally, the deferment period extends the date of payment by approximately 90 days or until funds become available, whichever comes first. Deferments expire on November 1 for fall, on April 1 for spring, and August 1 for summer. Deferments are a separate program and should not be confused with other University payment arrangements.

Financial Aid: Students who have officially accepted a financial aid offer through the Office of Financial Aid may be granted a deferment automatically. Some types of aid cannot be deferred. For example, federal work study is ineligible since funds are earned as wages throughout the year. Students are responsible for paying any outstanding balance not covered by the amount of aid deferred.

Veterans: Students participating in educational programs through the Department of Veterans Affairs may qualify for a deferment of tuition and housing. Interested students should contact the Office of the University Registrar for more information. Deferments are only granted prior to the tuition deadline for each semester provided all past due debts are satisfied.

Balance of Aid Refunds

Grants, scholarships and loans are credited to the student's account in the order received. After all charges are fully paid, refund checks will be issued as excess payments are credited to the account. Expected installment payments are deducted from the account prior to the release of the refund. All refund checks (except Plus Loan refunds) are made payable to the student and are mailed to the student's permanent home address. The refund check will be mailed five to seven business days after the refund entry is made on the account. Due to security reasons, checks are not available for pick up.

Replacement Checks

Checks that are lost, mutilated or destroyed can be replaced. Mutilated or expired checks should be submitted for replacement. For checks that are lost, 10 business days from the date the original check was issued must expire before a written request for a replacement check will be accepted. The ten-day period allows for the original check to be forwarded by the postal service or returned to the University. A "stop payment" of the original check requires

two-four business days to process at the bank. Once the stop payment has been confirmed by the bank, a replacement check can be issued. Expect a minimum of an additional two-four business days to process a replacement check. Please note that international checks will take longer.

Education Tax Credits

The Taxpayer Relief Act (TRA) of 1997, enacted by Congress, created two tax benefits for families who are paying for higher education. On January 31 of each year, all eligible students are issued a 1098T form for the prior calendar year. Students are directed to consult a tax professional or the Internal Revenue Service for matters related to tax credits.

Contact Information

Information related to tuition and fees, billing, refunds, payment options and related forms may be directed to Customer Relations located in the downstairs lobby of Alfred B. Rollins, Jr. Hall, Local (757) 683-3030 Toll-free (800) 224-1450, e-mail tuition@odu.edu. Payment address: Office of Finance, Old Dominion University, Alfred B. Rollins, Jr. Hall, Norfolk, VA 23529.

Fees for Noncredit Programs

The fees for noncredit programs vary according to the activity. Noncredit courses are free to all senior citizens on a space-available basis..

Graduate Financial Aid

Office of Financial Aid

The Office of Student Financial Aid supports the mission of the University by assisting students and their families in reducing or eliminating financial barriers that might prohibit their participation in the degree programs offered by Old Dominion University. The office administers need-based financial aid programs funded by Federal, State, University and private sources in the form of grants, Federal Direct Subsidized loans, Federal work-study programs, and both merit-based and need-based scholarships. In addition, the office administers the William D. Ford Federal Direct Unsubsidized Loan program and the Federal Direct PLUS and Grad PLUS loan programs, all of which are non-need-based federally supported sources of funding. Alternative loan options are also available.

Financial resources are available to assist Old Dominion University graduate students with their educational costs. Most stipends awarded to graduate students are insufficient for meeting all living expenses; therefore, other sources of income are necessary. Financial sources for graduate students typically include teaching, administrative and research assistantships, fellowships, tuition grants (all administered through the Office of Graduate Studies) as well as Federal Direct Stafford Loan Programs, and part-time student employment (administered through the Office of Financial Aid). Additional information about need-based financial assistance is available from the Office of Financial Aid.

Prospective graduate students should also consider applying for national fellowships, such as those awarded by the National Science Foundation, the Woodrow Wilson National Fellowship Foundation, the Ford Foundation (minority fellowship program), and the Danforth Foundation. Applicants should check program deadlines, some of which are as early as December 1. Information on fellowships in specific fields is available from the chair or program director of each department/school.

Regulations governing the administration of student financial aid are subject to unanticipated change. Information provided herein is as accurate as possible on the date of printing. For additional and updated information, students and interested parties are invited to visit the office's web site at <http://web.odu.edu/af/finaid/finaid.htm> or Old Dominion University's home page <http://www.odu.edu>.

Scholarships, Grants, Loans and Student Employment

The University offers a variety of awards each year to qualified students who have been accepted for admission into degree programs. Some of these awards are available only to Virginia residents, while others are awarded without regard to state residency. Student assistance is offered on the basis of scholastic achievement and/or established financial need. Financial need is defined as the difference between the cost of education/attendance at Old Dominion University and the amount of money an applicant and his or her family are expected to make available from their income and assets to meet the expenses of that education. The eligibility for non-need Federal Direct Unsubsidized loans and Federal Direct PLUS loans is determined by a combination of factors, including cost of attendance, and aggregate amount borrowed to date, to name a few.

To be eligible for assistance from the major student aid programs, a student must be a citizen or an eligible non-citizen. A student must be admitted and enrolled as degree seeking in an eligible program; must be registered with the Selective Service (if required); must not be in default or owe a repayment or refund on a federally guaranteed loan or grant; and must be in good academic standing (making satisfactory academic progress) to be eligible for financial assistance. Certain aid programs require a student to maintain a full-time status. There is one exception to the requirement that students be admitted on a degree-seeking basis: students who are admitted only for purposes of teacher certification may qualify for a William D. Ford Federal Direct Loan by submitting memo verifying their admission into approved licensure program by Director of Teacher Education Services in the Darden College of Education.

Financial aid eligibility is determined on an annual basis for one academic year (fall, spring, summer) only, and is determined for succeeding years upon re-application and continued eligibility. Applications for Old Dominion University-administered financial aid should be submitted as early as possible in January for consideration in the following academic year.

To be considered for the Annual and Endowed Scholarships administered by the University, an Admissions application or the Scholarship Application for Continuing Students must be received by the University by February 15

preceding the academic year of interest. All admitted students will automatically be considered.

An entering student must be accepted for admission into a degree-seeking program before receiving a financial aid eligibility notification letter, however, a student who has not yet been accepted for admission may apply for financial assistance. Once admitted into an eligible degree program, the student will automatically receive a notice of tentative financial aid eligibility. Announcements of financial aid eligibility for early applicants are generally made before May 1. The applicant will be notified in writing by the Office of Student Financial Aid. In addition, the admitted student is encouraged to monitor the status of his/her application for aid and its subsequent processing by accessing his/her records on the University's secure online site, LEO Online. Students may be notified by e-mail to their Old Dominion University e-mail accounts throughout the year. Alerts, reminders, and student-specific information are mailed through the University's secure e-mail system throughout the year, and students are responsible for reading and responding to these communications.

The information regarding financial aid contained in this catalog is subject to changes or deletions without notification. Additional information concerning financial aid is available through the Office of Student Financial Aid. The Guide to Federal Student Aid, which describes the federal student aid programs and how to apply for them, is also available free of charge from the Federal Student Aid Information Center (1-800-433-3243). The U.S. Department of Education provides efficient and secure access to information and government services and benefits for students via the Access America for Students gateway web site (<http://www.students.gov>).

Application Requirements

To be considered for financial aid, a student must complete all documents and submit them as soon as possible after January 1 preceding the academic year for which application is made. (For example, a student planning to attend during the Fall Semester, 2009 would submit a financial aid application in January, 2009.) The documents and deadlines are described below. Note: The Free Application for Federal Student Aid (FAFSA) is required of all applicants for financial aid.

Document 1: The Free Application for Federal Student Aid (FAFSA)

The Free Application for Federal Student Aid (FAFSA) is available to fill out online at www.fafsa.ed.gov. The site is known as FAFSA on the Web. Get U.S. Department of Education personal identification number called a PIN at www.pin.ed.gov. Find out what documents you need at www.studentaid.ed.gov/docs. Fill out the FAFSA on the Web Worksheet at www.studentaid.ed.gov/worksheet (this step is optional; the worksheet was designed for students who feel more comfortable filing something out on paper before going online to enter their application information). When completing the FAFSA, use Old Dominion University's Title IV Institution Code (003728). Fill out the FAFSA at www.fafsa.ed.gov. Keep an eye on your e-mail for a response and further instructions. FAFSA are also mailed to student by the U.S. Department of Education upon the student's request (call 1-800-433-3243). The paper FAFSA should be mailed to the Department of Education's federal processor, not to Old Dominion University. A pre-addressed envelope is provided with each application. Because the FAFSA must reflect income for the calendar year preceding the academic year aid is being applied for, it cannot be signed or mailed until after January 1.

Document 2: Student Aid Report (SAR)

Once the FAFSA is received and processed, you will receive your results by e-mail within a few days. This e-mail will contain a secure link so you can access your SAR online. If you have a "blocked" folder in your e-mail files, check it. Otherwise you'll receive a paper SAR in the mail in about two weeks. Students are strongly encouraged to keep their SARs and all other financial-aid-related documents for future reference. The SAR contains valuable information as well as a unique data release code.

Document 3: Employment Eligibility Verification

All U.S. employers are responsible for completion and retention of Form I-9 for each individual they hire for employment in the United States. This includes citizens and non-citizens. On the form, the employer must verify the employment eligibility and identity documents presented by the employee and record the document information on the Form I-9. Additional information can be obtained from the Office of Finance.

Document 4: Consortium Agreement and Dual Enrollment Forms

Students attending classes at a distant site may be required to submit these forms. These students should consult with their site director and their financial aid counselor to determine if these forms are required.

Standards of Satisfactory Academic Progress to Maintain Financial Aid Eligibility

Old Dominion University Requirements

Fulfillment of Federal Satisfactory Academic Progress is reviewed and evaluated by the Financial Aid Office in compliance with federal regulations. In order to qualify for assistance through the Office of Student Financial Aid, students must be accepted by the University as degree-seeking students. Students must be enrolled at least half-time (50%) to qualify for most financial aid programs.

Graduate students must be enrolled for a minimum of nine hours during either the fall or spring semester to be considered full-time. Half-time enrollment for graduate students is four hours during either the fall or spring semesters or three hours during the summer semester.

Eligibility and award amounts are based on the number of semester hours in which the student is enrolled. For purpose of financial aid, courses taken as Audit course do not count toward enrolled hours

The following quantitative and qualitative requirements apply to financial aid programs administered by Old Dominion University for satisfactory academic progress.

I. Review Policies

- A. Following the spring semester each year, the financial aid recipient's academic status will be reviewed. If the student has not maintained satisfactory academic progress, his or her financial aid will not be processed or will be canceled.
- B. The following shall be considered as credits completed:
 1. A through C- grades, graduate
 2. P – passing with credit
- C. The following shall not be considered as credits completed:
 1. F grades
 2. O audit, no credit
 3. W withdrawal
 4. I incomplete
 5. WF unofficial withdrawal
 6. Q grades
- D. Students who do not complete any credits, who receive a 0.00 GPA, or who do not successfully meet the satisfactory academic progress standards stated above will be placed on financial aid suspension.
- E. Students who enroll and subsequently withdraw after the official tuition deadline and receipt of aid for two semesters are ineligible for further financial aid. Example: Student enrolls Fall 2009, receives financial aid, and then withdraws. Student enrolls Spring 2010, receives financial then withdraws. The student is ineligible for financial aid beginning Summer 2010 and thereafter. This policy is not subject to appeal.
- F. Students who drop all courses prior to the official tuition deadline will be required to return all financial aid received, including loan proceeds and excess aid ("balance of aid"). Aid will be canceled and the student will be billed for all aid received. This policy is not subject to appeal.

II. Appeal of Financial Aid Suspension

- A. Once a student has been placed on financial aid suspension as a result of the routine annual review, he or she may appeal this action by submitting, in writing a completed Satisfactory Academic Progress Appeal Form. The completed form should be accompanied by the required supporting documents from the student's advisor. Completed forms should be submitted to the student's financial aid counselor. The appeal must document (a) reasons the student did not achieve minimum degree progress requirements and (b) the student's action plan to prevent recurrence of the academic progress deficiency. The Satisfactory Academic Progress Appeal form packet is available from the office's web site.

- B. The Office of Student Financial Aid will review the appeal and the student will be advised, in writing, of the decision. The decision will be based on factors that are beyond the control of the student such as documented medical factors.
- C. A student wishing reconsideration of a denied appeal may request reconsideration, in writing, with appropriate documentation attached, to the Associate Director of Student Financial Aid, whose decision is final.
- D. Graduate students suspended while in a degree-seeking program must receive approval from graduate program director prior to seeking reinstatement.
- E. Successful appeals of academic suspension item D above do not automatically result in reinstatement of aid eligibility. Request for consideration for reinstatement of financial aid eligibility is a separate process. The appeal (Satisfactory Academic Progress Form packet) for financial aid reinstatement must be submitted, in writing, to the student's financial aid counselor. Consideration for reinstatement of financial aid will consist of a strict review of degree progress and the student's plan for program completion without recurrence of the deficiency.

Federal Programs

Students must submit the Free Application for Federal Student Aid (FAFSA) to determine eligibility for all of the following federal financial aid programs.

Federal Work Study (FWS) Program

This program provides jobs for undergraduate and graduate students with financial need, allowing them the opportunity to earn money for educational expenses. The FWS program encourages community services work such as tutoring and work related to the course of study. A student who qualifies for FWS is not automatically guaranteed employment and must compete with other FWS recipients for available positions. The Career Management Center, located in Webb University Center, maintains a listing of available positions on its web site at <http://www.odu.edu/ao/cmcc/>.

Federal Perkins Loan Program

This low-interest (5 percent) loan is targeted for students with exceptional financial need. A Federal Perkins Loan borrower is not charged an origination fee or an insurance premium. A Federal Perkins Loan must be repaid.

Federal Direct Student Loan Programs

Old Dominion University participates in the William D. Ford Federal Direct Loan Program and thus receives loan funds directly from the U.S. Department of Education upon disbursement (payment) to eligible students. There are three kinds of loans:

William D. Ford Federal Direct Subsidized Loans

The federal government will pay the interest on these loans while students are in school and during deferments (postponements of repayment). Students must demonstrate financial need to receive this type of loan. Both undergraduate and graduate students may be eligible and must be enrolled at least half time. Like all other forms of aid, loans are disbursed to student accounts on a semester-by-semester basis, and eligibility must be re-confirmed prior to release.

William D. Ford Federal Direct Unsubsidized Loans

Available to eligible students regardless of financial need, but students will be required to pay all interest charges, including the interest that accumulates during deferments.

PLUS Loans for Graduate or Professional Students

Graduate or professional students are eligible to borrow under the PLUS Loan Program up to their cost of attendance minus other estimated financial assistance in both the FFEL and Direct Loan programs. These requirements include a determination that the applicant does not have an adverse credit history, repayment beginning on the date of the last disbursement of the loan.

Applicants for these loans are required to complete the Free Application for Federal Student Aid (FAFSA) and must have applied for their annual loan maximum eligibility under the Federal Subsidized and Unsubsidized Safford Loan Program before applying for a Graduate/Professional PLUS loan.

Conditions for Disbursement of Financial Aid

The Office of Student Financial Aid publishes a "Statement of Student Responsibility & Conditions for Release of Financial Aid" document each academic year. This statement is included with the initial award notification mailed to the student and is also accessible on the Financial Aid Office page of the University web site <http://web.odu.edu>. When students accept financial aid, they also acknowledge that they have read and agree to comply with the Statement. A limited sample of conditions is as follows:

1. Students are required to communicate immediately with their counselors if they change the number of hours enrolled each semester. Financial aid is based upon full-time, three-quarter-time or half-time enrollment. If a student's aid has been calculated based on an enrollment level different from the actual enrollment for that semester, the aid will not be released until the student has notified the counselor and the counselor has reviewed and recalculated aid eligibility. Financial aid eligibility changes when enrollment level changes. Students who drop courses are responsible for notifying the financial aid counselor immediately. Aid will be reduced accordingly and financial aid already received will be due back to the University. This also applies to "balance-of-aid" payments made to students prior to dropping.
2. The student is responsible for reporting additional educational assistance received through sources other than the Financial Aid Office. Financial aid may be adjusted according to federal regulations as a result of additional educational assistance received and not reflected initially. The student bears responsibility for reporting any additional aid in the form of scholarships from outside sources, Vocational Rehabilitation Benefits, Graduate Tuition Scholarships, Veterans Benefits, Senior Citizen Tuition Waivers, Employer Assisted Tuition Payments, Third Party Payment Agreements involving any outside group or company, and all other forms of assistance. The student must report these external sources of financial assistance immediately to his/her financial aid counseling team.
3. Federal Direct Student Loans and Federal Perkins Loans require Promissory Notes. Federal Direct Student Loan promissory notes may be signed online. Federal Perkins Loan Promissory Notes are produced by the Office of Student Financial Aid after all eligibility conditions have been met. Students must complete and sign the promissory notes and return them to the Financial Aid Office before the loan process can be completed. Entrance loan counseling is required of all first-time borrowers prior to release of loan proceeds.
4. A tentative or conditional financial aid package assumes a level of government appropriations which are frequently underdetermined at the time of preparation. If legislative bodies fail to provide the anticipated funding level, it may be necessary to reduce or cancel certain types of aid, particularly grants. Students will be notified immediately if such changes become necessary.
5. The Office of Student Financial Aid reserves the right to review, modify or cancel financial aid at any time on the basis of new information affecting student eligibility, including but not limited to changes in financial resources, residence, academic status, or changes in the availability of funds.
6. Students who withdraw from ALL courses are subject to regulations regarding the RETURN OF ALL TITLE IV FUNDS. If the date of complete withdrawal precedes the date on which 60% of the academic semester has been complete, a prorated portion of all Title IV student financial assistance will be due back to the federal programs. The University policy regarding tuition refunds following withdrawal is stated in the catalog and is independent of the Return of Title IV funds regulations. Students who withdraw from the University before 60% of the semester has elapsed should anticipate repaying a significant portion of Title IV financial assistance.

Awards Based on Admission to the University

Admissions Scholarships

All entering fall graduate students who submit their admission application and ALL required credentials by the early action/scholarship deadline (December 1 and transfer – March 15) are considered for merit based scholarships offered through the Old Dominion University Admissions Office. The admission application serves as the merit based scholarship application.

Information regarding minimum requirements for eligibility consideration can be obtained from the Admissions web site.

Annual and Endowed University Scholarships

Scholarships at Old Dominion University have been established through the generosity of individuals, organizations and corporations to recognize outstanding academic performance and to assist students in pursuing their educational goals. Scholarship awards are based on a variety of criteria. For some awards, eligibility is entirely determined by academic merit or potential. Other requirements might include demonstrated financial need, field of study, state or city residency, graduation from a particular high school or participation in a specific program, organization or activity. Generally, recipients have earned at least a 3.7 grade point average (on a 4.00 scale) and are full-time, degree-seeking students.

The Scholarship Form for Continuing and Graduate Students is available for students who are (1) students who began attending Old Dominion University before August 1999, or (2) students who have a change in scholarship eligibility according to the Criteria Check List (included in the Scholarship Form). Continuing students who meet the above circumstances must complete and submit the form to the Office of Student Financial Aid, 121 Rollins Hall, Norfolk, VA 23529-0052. The form must be received by February 15 each year to be considered for scholarships for the following academic year. The information provided on the Form for Continuing and Graduate Students will be maintained and used for scholarship selection for the duration of the student's attendance at Old Dominion University. It is not necessary to complete the form more than once during attendance at Old Dominion University, UNLESS the required information has changed. To determine eligibility for need-based scholarships (designated by an asterisk (*)), students must also file the Free Application for Federal Student Aid (FAFSA) PRIOR to February 15 of the appropriate academic year.

Selection procedures vary for these awards. All scholarships require admission to and enrollment in a degree program at Old Dominion University. For some scholarships, a portfolio, an audition or participation in a specific program may be required. The additional steps, if required, are summarized following each scholarship description.

Students will receive written notification of any scholarship for which they have been selected. Most scholarships will be awarded in April and May of each year. All scholarships must be formally accepted in writing.

College Scholarships

The College of Arts and Letters

The Eliot S. Breneiser Memorial Scholarship was established to assist a full-time music major in either the piano performance program or the music education program with a concentration in piano. Information concerning audition requirements is available from the Music Department. (AUDITION, PARTICIPATION) (757) 683-4061

The Dr. James V. D. Card Scholarship Fund was established by James V. D. Card to assist an undergraduate or graduate student who is majoring in English. The recipient must demonstrate financial need. (FAFSA)

The Friends of Women's Studies Scholarship is funded by an endowment in honor of Carolyn Rhodes for students majoring in women's studies. Two scholarships are awarded: one to a graduate student seeking an M.A. in humanities and one to an undergraduate student. Graduate students must have a minimum grade point average of 3.50. Recipients can be full- or part-time students. (FAFSA)

The Barbara M. Gorlinsky Memorial Fine Arts Scholarship is made possible by an endowment the Gorlinsky family established in memory of their daughter. It is designed to assist students with financial need who are fine arts majors. Information concerning portfolio requirements is available from the Art Department. (PORTFOLIO, FAFSA) (757) 683-4047

The Perry Morgan Fellowship in Creative Writing established in 2005 by Frank Batten and is awarded to two or more first year full-time graduate

students enrolled in the creative writing program. Recipients must maintain a minimum 3.5 GPA.

The Harvey Ronald Saunders Memorial Endowed Scholarship was established by Mr. and Mrs. Louis M. Saunders to assist an undergraduate or graduate student majoring in the arts/fine arts with an emphasis in painting or drawing. The recipient must have a 3.00 minimum grade point average, demonstrate financial need and be a citizen of either the United States or Israel. Information concerning portfolio requirements is available from the Art Department. (PORTFOLIO, FAFSA) (757) 683-4047

The Charles K. Sibley Art Scholarship is funded by an endowment made possible by contributions from the friends and patrons of the former Old Dominion University professor. Awards are to assist graduate or undergraduate students majoring in studio art or art history. Information concerning portfolio requirements is available from the Art Department. (PORTFOLIO) (757) 683-4047

The David Scott Sutelan Memorial Scholarship is made possible by an endowment established by David, Charles and May Scott Sutelan. The recipient will be seeking a master in fine arts in the creative writing program.

The Forrest P. and Edith R. White Endowed Scholarship Fund was established by Edith R. White to provide scholarships to students studying acting in the Old Dominion University Communication and Theatre Arts Department. (AUDITION)

The College of Business and Public Administration

The Jeffrey W. Ainslie Endowed Scholarship in Real Estate was established in 2006 by Jeffrey W. Ainslie to assist a full-time student in the Real Estate track in the College of Business and Public Administration. The student must have a grade point average of 3.0 or higher and must demonstrate financial need. Preference will be given to the student with the highest GPA and demonstrating the greatest financial need. (FAFSA)

The Theodore F. and Constance C. Constant Fellowships are funded by an endowment that assists two full-time graduate students in the College of Business and Public Administration.

The Larry J. and Elizabeth J. Creef Endowed Scholarship was established as an endowment by Larry J. and Elizabeth J. Creef to provide a scholarship to a student with an interest in pursuing a career with the Federal Bureau of Investigation (FBI), the CIA, the Department of Homeland Security or other security agency of the U.S. government. The recipient must be a Virginia resident and a U.S. citizen, must demonstrate financial need, be a full-time student enrolled in the College of Business and Public Administration and must have declared a major in accounting. (FAFSA)

The Wolfgang Pindur Endowed Scholarship in Applied Research is funded by an endowment given by the Department of Urban Studies and Public Administration to assist a full-time or part-time master's student (MPA or MUS) and/or a doctoral student (PhD in Public Administration and Urban Policy). An essay concerning the student's commitment to public service will need to be provided. (Essay) (683-6856)

The Charles H. and Mary Kathryn Rotert Scholarship is funded by an endowment established by Mr. and Mrs. Charles H. Rotert Jr. This scholarship is awarded to a deserving student in the College of Business and Public Administration.

The Susan (Merendino) Rowell Graduate Scholarship in Humanities was established in 2004 by Mrs. Susan S. Rowell to assist a graduate student majoring in humanities. The recipient must have a GPA of 3.4 or higher. This scholarship is renewable and preference will be given to students with full-time enrollment status.

The Marvin and Marilyn Simon Family Endowed Fellows Program in Business was established in 1994 to assist a master's or doctoral degree-seeking candidate attending the College of Business and Public Administration. The recipient will be a talented student studying in business who has outstanding academic ability.

The John R. Tabb Scholarship was established by an endowment by the Tabb family in 2004. It is the desire of the family to assist a graduate student studying economic development with an international focus. The recipient must be a U.S. citizen with residency in North Carolina, Virginia or Iowa. A minimum grade point average of 3.5 and demonstrated financial need is required. (FAFSA)

The Tidewater Association of Service Contractors (TASC) Scholarship was established to assist a full-time undergraduate or graduate student from the College of Engineering and Technology or College of Business and Public Administration degree program. A full-time/part-time Masters Certification in Government Contracting program or any other certificate program supporting government contracting within the Continuing Education

Departments may also be considered. The scholarship recipient must have a minimum grade point average of 3.0

The Rolf Williams Memorial Endowed Scholarship was established by the Propeller Club of the United States, Port of Norfolk to assist a full-time undergraduate or full-time graduate student in the College of Business and Public Administration. Student must be a rising senior with a declared major in Maritime and Supply Chain Management or a graduate student in the Master of Business Administration Program with a concentration in Maritime, Ports, and Logistics Management. Preference will be given to the student with greatest financial need and has at least a minimum of 3.0 cumulative GPA. (FAFSA)

The Darden College of Education

The Coca-Cola Scholars Endowed Scholarship Fund was established by the Coca-Cola Foundation. The scholarship recipient must be enrolled in a financial aid-eligible program leading to teacher certification, licensure, and/or enhancement. Consideration will be given to all students studying at rural Virginia TELETECHNET sites who have a minimum of 58 credit hours with a 3.00 cumulative grade point average. The recipient must also demonstrate financial need. (FAFSA, ESSAY)

The Sarah E. Armstrong Scholarship Endowment was established in 2002 in memory of the donor, Sarah E. Armstrong. The recipient must be a full-time student who has been accepted into the College of Education and must have an overall cumulative 3.2 grade point average.

The John Albert Gay Scholarship is made possible by an endowment given by Dr. and Mrs. R. A. Gay (Florence Vaughan). This scholarship assists a graduate student majoring in special education. Preference is given to those specializing in the area of the emotionally disturbed child. Student must demonstrate financial need. (FAFSA)

The Peggy Woofter Hull Scholarship is made possible by an endowment given by Marie D. Woofter in memory of her daughter. It is awarded to a full-time doctoral student in education. Students are nominated by their graduate program director and are selected by the Office of the Dean of the Darden College of Education. Recipients must demonstrate financial need. (FAFSA)

The Frank Hill Knecht Memorial Scholarship is made possible by an endowment given by Lena Rosa K. Conley, an alumnus and retired staff member of Old Dominion University, in memory of her brother. This scholarship assists a full-time graduate student in education. Preference is given to study in the area of special education. (FAFSA)

The Frank Batten College of Engineering and Technology

The Civil and Environmental Engineering Visiting Council Graduate Scholarship in Engineering was established by The Civil and Environmental Engineering Visiting Council (CEEVC) in 2003. The recipient must be either full- or part-time civil or engineering graduate student who has a minimum graduate or undergraduate grade point average of 3.25. Transfer students from other colleges or universities are also eligible for consideration.

The BBG Incorporated Endowed Scholarship in Engineering was established by BBG Incorporated for a rising junior or senior majoring in Electrical Engineering, Electrical Engineering Technology, Computer Engineering, or Computer Engineering Technology who holds a minimum cumulative GPA of 2.5. The scholarship is also available to a graduate student majoring in Electrical Engineering or Computer Engineering with a minimum cumulative GPA of 3.0. The recipient will also be considered for an Engineering Cooperative Education/Intern position with BBG Incorporated.

The Rollie Dubbe' Engineering Scholarship is funded by an endowment to assist a full time graduate engineering student who holds a minimum cumulative GPA of 3.0. The scholarship recipient must be enrolled in the civil engineering program with a preference in geo-technical engineering. Must demonstrate financial need (FAFSA).

The Stuart H. Russell Memorial Scholarship is made possible by an endowment established by the estate of Olive L. Spicer. The scholarship is awarded to a deserving student in the Frank Batten College of Engineering and Technology with particular preference given to a student in the Electrical and Computer Engineering Department with an interest in electronics.

The Tiwari Endowed Graduate Scholarship in Mechanical Engineering was established by Surendra N. Tiwari. The recipient must be a graduate level Mechanical Engineering student and be enrolled full-time or equivalent if registered as a Graduate Assistant. Must have a minimum Undergraduate or Graduate GPA of 3.0 and preference is given to an international student interested in scholarly activities and research.

The Clarke and Susan Vetrone Endowed Scholarship is funded by an endowment established by Clarke and Susan Vetrone to assist one undergraduate and one graduate student with an intending or declared major in the Batten College of Engineering and Technology. Both undergraduate and graduate student must be enrolled full-time and demonstrate financial need. Undergraduate student must have a minimum GPA of 2.75 and preference will be given to a student with learning disabilities. Graduate student must have a minimum of 3.0 GPA. (FAFSA)

The Edward L. White Endowed Scholarship was established by Edward L. White, Jr. and Margaret W. Moore to assist a computer engineering student. The recipient must be a Norfolk resident, have a minimum 3.30 grade point average and demonstrate financial need. (FAFSA)

The George C. Winslow Scholarship is made possible by an endowment to assist a graduate or undergraduate student who has demonstrated financial need and has obtained at least a 2.50 grade point average while pursuing a degree in mechanical engineering. (FAFSA)

The College of Health Sciences

The Thomas Charles Auclair ('78) Scholarship is made possible through an endowment given by Mr. and Mrs. George E. Auclair in memory of their son. The scholarship supports a student pursuing studies in environmental health.

The Friends of Dental Hygiene Endowed Scholarship was established by Mrs. Linda Fox Rohrer in 2004. Recipients must be either full-time graduate or undergraduate students. The scholarship will be awarded to a deserving student in the School of Dental Hygiene. The recipient must also demonstrate financial need (FAFSA).

The Gene W. Hirschfeld Scholarship is supported by an endowment given by the former chair of the Department of Dental Hygiene and Dental Assisting. The scholarship is awarded to undergraduate or graduate students who demonstrate financial need and are enrolled in the Dental Hygiene Program. (FAFSA)

The College of Sciences

The Sarah E. Armstrong Science Scholarship Endowment was established in 2002 in memory of Sarah E. Armstrong. The recipient must be a full-time student who has been accepted into the College of Sciences and must have an overall cumulative 3.2 grade point average.

The Virginia S. Bagley Endowed Scholarship is made possible by Mrs. Bagley's estate and is awarded to a graduate or undergraduate student in the Department of Biological Sciences.

The Hampton Roads Maritime Scholarship is funded by an endowment from the Hampton Roads Maritime Association and is given to a graduate student in the Department of Ocean, Earth and Atmospheric Sciences with financial need. (FAFSA)

The Neil and Susan Kelley Endowed Scholarship Fund, established by Neil Kelley in 2001, provides financial support to a graduate student pursuing a Master of Science in Oceanography. The scholarship is awarded strictly on merit and may be renewed annually.

The Harold G. Marshall and Vivian J. Marshall Scholarship in Biology is funded by an endowment given by Harold G. Marshall and Vivian J. Marshall. This scholarship is provided to assist a full-time graduate student in the Department of Biological Sciences with a specific concentration in ecology.

The Dorothy Brown Smith Endowed Scholarship was established in 2004 to assist a graduate student who is enrolled at least half-time in the Department of Ocean, Earth, and Atmospheric Sciences of the College of Sciences.

The Jacques S. Zaneveld Endowed Scholarship was established by Dr. Jacques S. Zaneveld to assist a graduate student in the Department of Ocean, Earth and Atmospheric Sciences of the College of Sciences. The recipient must demonstrate a need for funding in the preparation of his/her dissertation in the field of biological oceanography. (FAFSA)

Military Awards

Army Reserve Officer Training Corps (AROTC) participants may qualify for scholarships. More information on application procedures and program requirements is available from the faculty of the Department of Military Science. (PARTICIPATION) (757) 683-3663

Naval Reserve Officer Training Corps (NROTC) participants may qualify for full or partial scholarships. More information on application

procedures and program requirements is available from the faculty of the Department of Naval Science. (PARTICIPATION) (757) 683-4744

The Lucille D. Thompson Memorial Scholarship is sponsored by the American Legion Women's Post No. 118. The scholarship is awarded to an honorably discharged veteran who demonstrates financial need. (FAFSA)

Other Awards (General)

The Alumni Association Outstanding Scholar Fellowships were established in 1984. The fellowships are awarded to two graduate students in good academic standing who are attending Old Dominion University on a full-time or part-time basis. One fellowship must be awarded to an Old Dominion University alumnus/alumna who has been admitted as a full-time student to a graduate program at the University.

The Bannon Foundation Quasi-Endowed Scholarship was established to assist four students of the Eastern Shore of Virginia with their commuter expenses.

The Friends of Women's Studies Scholarship is funded by an endowment in honor of Carolyn Rhodes for students majoring in women's studies. Two scholarships are awarded: one to a graduate student seeking an M.A. in humanities and one to an undergraduate student. Graduate students must have minimum grade point average of 3.50. Recipients can be full or part-time students. Students are selected by the Director of Women's Studies and candidate selection is forwarded to the Office of Financial Aid, scholarship coordinator. Student must demonstrate financial need. (FAFSA)

The Nancy Topping Bazin Scholarship was established by the Friends of Women's Studies to assist a graduate student in women's studies.

The John R. Burton Jr. Scholarship is made possible by an endowment given by John R. Burton Jr. This scholarship assists students who demonstrate financial need. Preference is shown to high school graduates who have been reared in the Hope Haven Children's Home. (FAFSA)

The Robert Claytor Memorial Scholarship is funded by an endowment from the friends of Robert Claytor for a student who demonstrates financial need, according to federal needs analysis. (FAFSA)

The Delta Sigma Lambda-Dr. Ruth Harrell Scholarship is supported by an endowment to assist women who have received a bachelor's degree and are full- or part-time graduate students enrolled at Old Dominion University. Selection is also based upon scholastic ability, financial need and good personal character. Preference is given to those students who have lived in the Commonwealth of Virginia for at least one year. Students must also complete a separate application, which is available in the Old Dominion University Women's Center. Delta Sigma Lambda members are eligible for the award. (FAFSA) (757) 683-4109

The Charles H. Eure Memorial Scholarship is awarded to a marine science or engineering student who has a 3.00 grade point average and is of sound moral character. Preference will be given to a STASR (South Tidewater Association of Ship Repairers) company family member.

The Lillian Vernon Endowed Scholarship is funded by an endowment from the Lillian Vernon Foundation. It is awarded to a spouse, child, or grandchild of an active Lillian Vernon employee. Recipient must have a minimum grade point average of 2.80 and demonstrate financial need. (FAFSA)

The Memorial and Recognition Scholarship Fund is an endowed scholarship that will be awarded to a student with a minimum grade point average of 3.00 and is able to demonstrate involvement in community service.

The Meredith Construction Company Scholarship is made possible by an endowment given by the Meredith Construction Co. Inc., Meredith Realty, et al. and members of the Meredith family. The award is given to a graduate student demonstrating academic merit in his/her chosen curriculum.

The Sherwood/Portsmouth Scholarships are funded annually by a trust established by the late Calder Sherwood III, a professor emeritus in the departments of Chemical Sciences and Physics/Geophysical Sciences. Professor Sherwood served on the Old Dominion University faculty for 38 years. The scholarships are awarded to graduates of public high schools in Portsmouth, Virginia who demonstrate financial need. (FAFSA)

The Town-N-Gown Scholarship has been established by Town-N-Gown, an association dedicated to promoting cooperation between the Hampton Roads community and the University in order to promote better understanding in fulfilling the aims and ideals of each. The scholarship recipient rotates annually from the following: (1) resident of the greater Hampton Roads area, (2) a member of or dependent of active duty military personnel and (3) a dependent of an Old Dominion University faculty or staff member.

The Hugh L. Vaughan Scholarship has been established by an endowment made by Mr. Hugh L. Vaughan to assist handicapped students. Preference is given to blind students. Recipients must be native-born Virginians.

The E. C. Wareheim Foundation “Returning Women’s” Scholarship has been established by an endowment to assist one or more returning women from Norfolk, Virginia Beach, Portsmouth, Chesapeake or Suffolk who have demonstrated financial need. Preference is given to students who enroll part-time. (FAFSA)

The Jane L. and Robert H. Weiner International Affairs Scholarship is made possible through an endowment established by Mr. and Mrs. Weiner to assist a student who will be studying abroad through the International Student Exchange Program (ISEP). Preference will be given to students who will study in a Third World or developing country for the purpose of fostering international understanding and peace and who demonstrate academic achievement and financial need. (FAFSA)

The Calvert S. Whitehurst Scholarship is funded by an endowment established by Mr. Robert B. Kendall and augmented by the Whitehurst Scholars Scholarship Foundation. The endowment recognizes the contribution of both Mr. Calvert S. Whitehurst and his son, Professor G. William Whitehurst, former member of the U.S. Congress. The scholarship is awarded to a student with financial need who demonstrates academic potential. (FAFSA)

The Linda Hyatt Wilson Graduate Scholarship in China Studies was established by Linda Hyatt Wilson to award one scholarship to a full-time graduate student who has a 3.5 grade point average, demonstrates financial need, and are involved in the study of China’s culture, history, economy, politics, or foreign relations.

Other Financial Aid Resources

The Parker Lesley Endowed Fund has been established for students who demonstrate need for special circumstances. Special circumstances are defined as emergency travel, supplies, equipment, etc.(ESSAY) (757) 683-6856

The James Stamos Scholarships in Voice and Piano are made possible by a bequest from Mr. Stamos to assist several students who are majoring in either voice or piano. Information concerning audition requirements is available from the Music Department. Contact Mr. Dennis Zeisler, chair of the department. (AUDITION) (757) 683-4061

The Student Activities Scholarships in music are awarded to students who participate in one or more Music Department activities including concert choir, band, orchestra, Madrigal Singers and brass choir. Information concerning audition requirements is available from the Music Department. Contact Mr. Dennis Zeisler, chair of the department. (AUDITION, PARTICIPATION) (757) 683-4061

The Viburnum Acting Endowed Scholarship Fund was established by the Viburnum Foundation to provide monetary awards to acting students. (AUDITION) (757) 683-3608

The Institute for Learning in Retirement Scholarship is a two-year scholarship established by the Institute for Learning in Retirement for a student of any discipline who demonstrates financial need, has a baccalaureate degree, is a resident of Hampton Roads, and has a 3.00 grade point average. (757) 368-4160

Veterans and Dependents Benefits

Information about the administration of education assistance under the Veterans Administration may be obtained from the VA website: www.vba.va.gov. Students wishing to use their VA benefits at Old Dominion University may find further information on the University Registrar’s web page: <http://www.odu.edu/webroot/orgs/AF/REG/registrar.nsf/pages/MSS+Home>.

Contact Military Student Services staff in the Office of the University Registrar for further assistance by phone: 757 683-4425; by FAX: 757 683-5865; or by email to adance@odu.edu.

Termination of Aid

Failure to remain in good academic standing will result in automatic withdrawal of financial aid by the University. Failure to comply with the conditions of a financial award will cause its termination and the return of any unexpended funds as well as repayment, in some cases, of funds already utilized.

Financial Aid Deferment

A deferment is an extension granted by the University which allows a student receiving scholarships, grants, or student loans to delay payment of tuition and fees. Fall semester deferments expire on October 1, Spring semester deferments expire on March 1, and Summer semester deferments

expire on August 1. Students who have officially accepted an offer of financial aid by submitting a signed award acceptance letter and demonstrating intent to comply with any and all verification requirements and loan eligibility requirements at least one week prior to the first day of classes for the semester will be granted a deferment automatically.

Some types of aid cannot be deferred, including but not limited to Federal Work Study (which must be earned by employment and for which payment is made directly to the student), Federal PLUS loans, room scholarships, book scholarships, board scholarships, and payments by third parties (contractual arrangements, private scholarships, etc.). NOTE: Federal Direct student loan deferments are calculated at the net value of the loan (less the federally-set loan origination fee).

If the amount of the financial aid deferment is less than the student’s tuition and other charges for the semester, the student is responsible for paying the excess charges (total bill minus anticipated deferment) by the stated tuition deadline for that semester.

Students are responsible for paying any outstanding balance not covered by the amount of aid deferred. Late charges and other actions may be levied in the event of failure to meet financial obligations. For additional information, contact the Office of Finance.

Regulations governing the administration of student financial aid are subject to unanticipated change. Information provided herein is as accurate as possible on the date of printing.

Financial Awards for Graduate Students

Financial awards are determined by the graduate program and college dean following the policies and guidelines described below. For specific qualifications, conditions, amounts, length and types of awards, contact the appropriate graduate program director.

Graduate Assistantships

A. Nature of the Graduate Assistantship

The graduate assistant is expected to participate directly in either instructional, research, or administrative duties in support of the ongoing activities of the University's academic, research, and service units.

It is the University's intention to make the assistantship an integral and valuable part of the student's graduate education. It should be viewed as an apprenticeship in teaching, research, or administrative service.

B. Categories of Graduate Assistants

1. Graduate Teaching Assistant (GTA) - participates directly in teaching activities, such as the teaching of a course or holds responsibility for a laboratory section, or is assigned to specific instructional support or related activities. The University recognizes two levels of graduate teaching assistant responsibilities and activities, i.e., the Instructor Level GTA and the Assistant Level GTA.
 - **GTA Instructors** directly communicate and interact with students in ways that lead to the conveyance of knowledge or skills required to successfully complete the course. Included in this category are graduate students who serve as instructors, laboratory supervisors, recitation leaders and tutors.
 - **GTA Assistants** do not directly instruct students in the knowledge or skills imparted by the laboratory experience, instead, TA Assistants serve as graders, help the instructor research articles and materials to be used by the instructor in preparing lectures or handouts, or as laboratory assistants who prepare equipment solutions, etc.
2. Graduate Research Assistant (GRA) - participates directly in research or support activities conducted by faculty members or administrators. There are three sources of funding for GRAs: those funded through Commonwealth sources, those funded by local funds, and those whose stipends are paid by the Old Dominion University Research Foundation (ODURF) from grants and contracts.
3. Graduate Administrative Assistant (GAA) - participates directly in the support of the activities of a University administrative unit (e.g. student services or athletics).

C. Graduate Teaching Assistant Instructor Institute (GTAI Institute) Requirement

1. All GTA-Instructors will be required to pass the GTAI Institute in order to receive a GTA stipend. GTA Assistants are not required to pass the GTAI Institute but must be approved and supervised by the appropriate faculty instructor. The Office of Graduate Studies will keep records of the students who have completed the Institute and will inform the appropriate departments of a particular student's eligibility for a Teaching Instructor assignment.
2. The Institute is offered twice a year during the week before fall and spring classes begin. All graduate assistants, including those who have research and/or other non-instructional assignments, are encouraged to participate in the Institute in anticipation of future teaching assignments. Departments are encouraged to develop their own programs for training graduate teaching assistants. Such programs should be tailored to the specific needs of the discipline and department policies.

D. Application

Application forms for graduate assistantship stipends paid by the University (GTAs, GRAs, and GAAs) are available from the Office of Admissions or from the University's web page. The completed form, together with a brief essay by the applicant discussing academic interests and career objectives, must be submitted to the appropriate graduate program director or office making the appointment, as soon as possible for fullest consideration. Applications for GRA positions funded through ODURF are made through the faculty member who is principal investigator, the department chair, or graduate program director.

E. Eligibility

1. Only students admitted to graduate degree programs in regular or provisional status on the basis of complete and fully evaluated credentials and in good academic standing are eligible for appointment to a graduate assistantship. Additional criteria apply for appointment as a graduate teaching assistant (GTA) (see section on appointments).
2. All students appointed to a graduate assistantship are required to verify their identity and employment eligibility and complete an I-9 Form, according to University procedures, prior to commencing their duties. This requirement is established in order to comply with the Immigration Reform and Control Act of 1986. Students are also required to complete the Child Support Disclosure and Authorization Form, the Commonwealth of Virginia's Policy on Alcohol and Other Drugs Form, ODU Use of the Internet and Electronic Communication Systems Certificate Form, and the Commonwealth of Virginia Selective Service Form, and the Employee Payroll Direct Deposit Authorization Form.
3. Students who are not in good academic standing are ineligible to hold an assistantship. **Assistantship appointments will be terminated for any student whose GPA is less than 3.0.**

F. Enrollment Requirements

There are two categories of enrollment requirements:

1. Assistantship recipients who are supported by University/Commonwealth funds are required to be enrolled each fall and spring semesters of their appointment and must register for and complete a minimum of nine hours of graduate course work per semester and three hours in the summer.
2. Assistantship recipients who are supported by other funding sources are required to be enrolled each fall and spring semesters of their appointment and must register for and complete a minimum of six hours of graduate course work per semester and three hours in the summer.

All doctoral students (regardless of their funding source) who have successfully advanced to candidacy and only need to complete the dissertation must register for at least one hour of graduate credit to be eligible for full tuition exemption. Graduate Form 28 (1-Hour ABD Notification for Graduate Assistants) must be completed and sent with the E-1S payroll form to the Office of Graduate Studies. This must not be construed to mean a change in the degree requirements in order to graduate. Students are still required to complete all of the credit hours as listed in the individual department sections necessary for the degree. Undergraduate prerequisite courses and courses taken for audit are not normally counted toward the enrollment requirement, except upon the recommendation of the program director, department/school chair, and the dean of the appropriate academic college and the approval of the vice provost for graduate studies.

- Graduate assistants normally may not enroll for more than nine credit hours per semester. Enrollment for 10 to 12 credit hours requires the approval of the appropriate program director. No graduate assistant will be permitted to enroll for more than 12 credit hours in any semester an appointment is held.
- The Board of Visitors has authorized the president or his or her designee, the vice provost for graduate studies, to consider waivers related to the minimum enrollment requirements specified above.

G. Appointment Process

1. Assistantships in Departments/Schools

The dean or other appropriate administrator notifies the individual departments/schools or units of their allocation of assistantships for the coming year.

- a. The department/school recommends candidates for the assistantships to the appropriate academic dean. Candidates should be interviewed before final recommendations are made for appointment. Particular care should be taken in the consideration of applicants to determine the adequacy of academic preparation and language skills. A completed E-1S form or ODURF Form 108 for all graduate assistant appointments will accompany the candidate's nomination to the dean or administrator. All completed E-1S forms with award letters, acceptance forms and job descriptions are to be sent to the Office of Graduate Studies for processing. ODURF 108 forms are to be sent to the Old Dominion University Research Foundation. Prior to submission of a nomination, the department/school should determine whether the student has been nominated for or accepted another graduate assistantship.
- b. Nominations are reviewed and approved by the dean of the academic college or his/her designee to insure that applicants meet the eligibility criteria for appointment, such as admission to a degree program, English language proficiency requirements, good academic standing, and enrollment, and that the appointment is in compliance with applicable University and college policy.
- c. Applicants for GTA appointments must demonstrate written and oral fluency in the English language. For international students, a good command of written English will be evidenced by acceptable TOEFL scores and required entrance essays. Oral proficiency in English will be determined through the SPEAK test administered by Old Dominion University's English Language Center personnel. A passing score on the SPEAK test is 50. Students who marginally fail the SPEAK test with a score of 45 will be offered the opportunity to participate in a re-test as a part of the GTAI Institute to determine if face-to-face communication is sufficient for holding a teaching assistantship.

2. Assistantships in Non-Departmental Units

- a. Each non-departmental unit, e.g., Career Management Center, Athletics, Registrar, submits to the Office of Graduate Studies a position description for each Graduate Administrative Assistant (GAA) position available within their unit. Along with the position description the unit will provide a list of those graduate programs in which students have or are proposed to have the interest and skills required. The position must require and provide an academically and programmatically appropriate level of intellectual and professional activity. The Vice Provost for Graduate Studies and Research will coordinate a review of the position descriptions by the appropriate department(s). If the position description is approved, the department chair and graduate program director will coordinate with the non-departmental unit the selection of academically qualified and highly ranked students from their current or to-be recruited graduate students. The appointment of the GAA is made jointly by the academic and non-departmental administrative departments.
- b. Determination of the number and the availability of funds must be done as early as possible in order to facilitate offering these GAA positions to the top ranked applicants/students in the appropriate graduate programs. As part of the Dec-Jan budget submission process, non-departmental units must submit a justification for continued and increased support of GAAs, i.e., stipends and tuition waiver. The Office of Graduate Studies will notify the appropriate graduate program directors of the number of anticipated GAA positions that can be offered to highly recruited applicants for the upcoming and FA, SP, and SU admission cycles. All GAA awards funded by non-academic units will be processed by the Office of Graduate Studies.
- c. Each semester, the GAA's immediate, non-departmental supervisor will evaluate the performance of the student and make recommendations for continuance or termination. This written evaluation will be reviewed by the graduate student and his/her GPD or academic advisor and a final set of recommendations made regarding continued awarding of the assistantship.

H. Appointment Workload

Graduate assistantships require 20 hours per week of service and are generally made for a period of one academic year with a nine-month performance period. For a GTA (instructors and administrative assistants), the work load should include no more than six hours of classroom teaching or nine contact hours of laboratory supervision per semester, plus normal preparation time.

Nominations should be submitted at least 30 days before the semester of employment in order to assure adequate time for processing. A graduate assistant funded through a grant or contract may be appointed for shorter periods if required by the conditions of the grant or contract.

An assistantship workload (20 hours per week) may be divided between teaching and research duties with the approval of the dean of the appropriate academic college. A graduate assistant appointment may be renewed upon nomination, review of qualifications, and satisfactory previous performance.

I. Additional Employment

Full-time (20 hours per week) graduate assistants are not permitted to accept additional on-campus employment during the period of their assistantship. In particular, graduate assistants (graduate teaching assistants, graduate research assistants, and graduate administrative assistants) may not be paid for part-time teaching or other campus employment for the University in addition to their normal responsibilities. Exceptions to this policy may only be made under unusual circumstances and only with the approval of the dean of the appropriate college or equivalent administrator upon the written recommendation of the graduate program director and the department/school chair. Any outside employment (i.e. off-campus) should be undertaken with caution and in consultation with the GPD. It should in no way adversely affect academic performance or assistantship duties and responsibilities. Information on employment guidelines that are specific to international students may be obtained in the Office of International Student and Scholar Services.

J. Evaluation and Monitoring

All graduate assistants shall be provided with a written job description of their responsibilities, and be evaluated at least once by their supervisor (s) during the period of the award, preferably before the end of the first semester of service is completed. The evaluation shall be discussed with the assistant and a copy forwarded to the appropriate graduate program director, chair, and vice provost of graduate studies.

K. Termination

A graduate assistantship normally ends when the period of appointment is concluded and the terms of the assistantship agreement are fulfilled. Otherwise, a graduate assistant may be terminated for the following reasons:

1. Resignation by the student. Resignation shall be in writing to the supervisor with a copy to the appropriate department chair, program director, and academic dean or equivalent administrator.
2. Failure of the student to perform his or her assigned duties adequately. Termination must be recommended by the student's supervisor and approved by the department chair, graduate program director, and the appropriate academic dean or equivalent administrator.
3. Failure of the student to remain in good academic standing in accordance with the graduate continuance regulations.
4. Failure of the student to maintain enrollment in the requisite number of graduate credits.
5. Expiration of a grant or contract that funds the student's stipend.
 - Any overpayment must be reimbursed to the University by the student as soon as possible after termination. Failure to repay the amount owed may result in legal action against the student for recovery.
 - If a student resigns from an assistantship or is terminated for reasons other than the completion of the appointment or expiration of the funding contract, the department chair or graduate program director should notify the appropriate academic dean or administrator as soon as possible and nominate a replacement if necessary.
 - A student who believes that he or she may have been unjustly terminated may appeal the decision. First, the student should

meet with the supervisor, graduate program director, and department chair in an effort to resolve the situation. If this effort fails, the student may make an appeal in writing to the dean or administrator of the appropriate academic college. If the matter is not resolved, it will be referred to the vice provost of graduate studies who will automatically refer the matter to the Graduate Appeals Committee for review. The committee will make its recommendation to the vice provost of graduate studies who then makes the final decision.

Tuition Waivers

Graduate students who are awarded a fellowship or who are employed as graduate assistants may receive partial to full tuition assistance. The decision as to whether a student receives partial or full tuition is made by the students' academic program.

Minimum Stipend Levels

In compliance with federal guidelines a graduate student must receive a minimum of \$3,200 in assistantship or fellowship support for the fall and spring semesters and a minimum of \$2,500 during the summer. Supplements to the minimum stipend amount can be made based upon the availability of funds and upon approval of the appropriate dean and the funding agency. The stipend is considered to be taxable income since it is payment for services.

Return of Tuition Assistance

A student who completes less than half of the assistantship or fellowship appointment will be required to return his/her full tuition assistance award to the university. All graduate assistants must comply with the appropriate enrollment requirements as outlined in the Enrollment Requirement section of this catalog.

L. Grievance Procedure

Should a graduate assistant believe that his/her assigned duties and/or the workload required to fulfill these duties do not conform to university graduate catalog policies, he/she should first attempt to reconcile the grievance with his/her academic/nonacademic immediate supervisor. If the grievance is not resolved, the graduate assistant will ask his/her graduate program director (GPD) to mediate the grievance between him/her and the immediate supervisor. If the GPD is the student's immediate supervisor, the GPD chair/dean's designee will attempt to mediate. If the chair is the student's supervisor, the GPD shall refer the case directly to the dean or the dean's designee. If this course of action does not resolve the grievance, the GPD/chair/dean's designee will seek mediation with the supervisor of the student's immediate supervisor. If a resolution cannot be achieved, the chair/dean's designee will appoint an ad hoc committee comprised of two senior faculty members from the student's department and one senior faculty member from another department. If the student's assistantship is a non-academic unit, the third member will be a senior level administrator from the nonacademic unit. Should the committee not resolve the grievance, it will be referred to the dean of the student's college for a final decision. For matters involving sexual harassment and/or discrimination, please see the "Sexual Harassment Policy and Procedures" or the "Discrimination Complaint Procedure" in this catalog.

M. Recognition of Graduate Teaching Assistant Performance.

Each academic year, two graduate teaching assistants will be recognized for their outstanding performance as a classroom or laboratory instructor. Recipients of the Outstanding Teaching Assistant Awards will receive a \$1,000 financial award to be used to support their educational expenses. A request for nominations and criteria is distributed by the Office of Graduate Studies.

Graduate Fellowships

Fellowships are awards granted for scholastic achievement and promise. Their objective is to enable full-time students to pursue graduate studies and research leading to advanced degrees without requiring them to render any service. Part-time and/or nondegree students are not eligible. Fellows are responsible for payment of their tuition, in- or out-of-state, as applicable. University fellows are chosen by their graduate programs and are supervised by their colleges. Applicants should indicate their intent to apply for a fellowship when applying for admission. Letters of recommendation, current transcripts, and any additional evidence of scholastic achievement that would assist in an evaluation of the student should be on file in the Admissions Office.

Dissertation Doctoral Fellowships for graduate students are available to full-time students for the pursuit of graduate studies and research leading to the doctorate, with no requirements to render service. These awards currently carry a stipend of \$15,000.

Tuition Grants

Tuition grants may be offered to full-time regular or provisional degree-seeking graduate students. Part-time tuition grants may also be available for Virginia residents. Applicants should indicate their desire to apply for tuition grants when applying for admission. Students holding tuition grants who withdraw from courses will be held personally liable for repayment of funds utilized. Students receiving tuition grants must be registered for nine graduate credits each semester and six in the summer.

Graduate Policies and Procedures

Policy on Nondegree Credits to Complete a Degree

No more than 12 credit hours of graduate-level course work taken at Old Dominion University as a nondegree student may be applied toward a graduate degree or certificate. These 12 credit hours may include only coursework for which grades of B or higher are earned. These credit hours are in addition to the 12 credit hours that can be transferred from other institutions and through experiential learning.

Attendance Policy

Regular classroom attendance is expected of all students and individual faculty may require class attendance. Course grades reflect not only performance on written assignments and exams, but also participation during class periods. As discussions cannot be reproduced, many times absences cannot truly be made up. Excessive absences therefore have a negative effect on the student's learning and performance. Students are responsible for all class work, and a student who misses a class is expected to have the initiative necessary to cover properly the material missed. Students must meet all course deadlines and be present for all quizzes, tests, and examinations.

Syllabus information will include a statement of the attendance policy for each course and the effect of nonattendance on grades. Reasonable provisions should be made by the instructor for documented representation at University-sponsored athletic or academic functions, mandatory military training and documented illness. The granting of provisions for other documented absences is left to the discretion of the faculty member.

Due to the nature of asynchronous courses, students are expected to participate in class, but in formats that may not require attendance at regular intervals.

Extended illness. The student should notify the Office of Student Affairs when the student is going to be absent from classes for more than one week because of an illness. Student Affairs will notify the student's course instructors of the absence on his or her behalf.

Class Attendance by Guests

Statement: The propriety for non-student presence in the classroom will vary dependent upon the nature of curricular offerings, dangers inherent to certain classrooms and labs, the optimum classroom environment for each class, and the preferences of each instructor. Guidelines specifying whether non-student guests will be permitted in the classroom, which are consistent with departmental policy, will be established for each class by the instructor and included in the syllabus for the course. These guidelines will apply to each site at which the class is offered.

Continuous Enrollment Policy

Master's, Education Specialist, and Pre-candidacy Doctoral Students. Students who have completed all course work but are working during a given semester to complete other outstanding degree requirements (e.g. comprehensive examination, thesis, removal of an I or II grade) or wish to use University facilities and/or consult with faculty must be registered for at least one credit during that semester. In addition, graduate students must be registered for at least one credit hour in the semester in which they graduate. GRAD 999 or the program equivalent may be used to fulfill this requirement.

Registration for GRAD 999 or the required program equivalent is subject to the normal fees and regulations of the University.

Doctoral Students After Advancement to Candidacy. After successful advancement to candidacy, all doctoral students are required to be registered for at least one graduate credit hour each term (fall, spring, and summer) until the degree is completed, including the semester in which they graduate. Failure to comply with this requirement will result in charges to the student's account for one graduate credit hour plus required fees for each semester after passing the candidacy examination. Students are not eligible for graduation until all charges are paid.

Additional Graduate Degrees Policy

Graduate students may pursue an additional graduate degree in any discipline at Old Dominion University. Students may request that graduate level course work used to fulfill requirements for one ODU graduate degree be applied to another graduate program. Such a degree may be sought subsequent to or concurrently with another degree. Approval of the graduate program directors and appropriate college deans is required.

Graduate Writing Proficiency

Each graduate department or program will develop specific policies and procedures for evaluating and, if necessary, upgrading student writing.

Graduate Pass/Fail

Master's-level students may include pass/fail-graded experiences to fulfill a portion of their program requirements provided that they meet a University requirement of 24 credit hours of course work, of which at least 18 hours must be letter-graded course work, and any additional departmental or school requirements. The college, school and/or department administering the program shall determine which student course work shall be considered for pass/fail credit.

Doctoral students must take dissertation credit as pass/fail and may select from among the designated pass/fail-graded experiences a portion of their program requirements, provided that they take a minimum of 24 credit hours of letter-graded course work, of which at least 18 hours must be letter-graded course work, beyond the master's degree, or equivalent, and meet any additional departmental or school requirements.

Deans may, at their discretion, designate courses as pass/fail, letter graded or both.

A student electing the pass/fail option for a particular course cannot change his or her registration and elect to take the course for grade point credit after the end of the "add" period. Similarly, courses cannot be elected as pass/fail after the end of the "add" period.

Declaration or Change of Major or Program

A provisional or regular graduate student who wishes to change to a program other than the one of original admission must make the request in writing to the main campus Admissions Office or to his/her site director. The student's graduate record will be examined to ascertain what, if any, other supporting credentials must be submitted (e.g., test scores, letters of recommendation) prior to consideration for admission to the new program. If it is determined that no other supporting credentials are necessary, the student's record will be submitted to the graduate program director of the new program, with a request for consideration of admission. The student will be notified in writing of the decision. If not admitted to the new program, the student will be retained as a provisional or regular student in the original program.

When the new program requires other and/or additional supporting credentials, the student must submit these before consideration can be given to the change.

Credits earned toward a degree or certificate for the original program may or may not be accepted by the director of the new graduate program. All grades earned in the original program remain on the student's transcript but only grades of B or higher are used to compute the GPA in the new program.

Conversion from Doctoral to Master's Program

A student in a doctoral program may be converted to an appropriate master's program in special situations. The doctoral student making satisfactory progress but wishing to leave the University may apply in writing to the new master's program director, with copies to the current program director and the applicant's committee. The new program director, in consultation with the current program director, will review the request following program policy and procedures.

In the case where a doctoral student fails to pass or complete a particular degree requirement, the student's committee may recommend the student to a master's degree program. The student will follow the procedure outlined in the preceding paragraph, except that this approach requires supporting documentation from the current committee.

Once the student is accepted, the new program director will send a memorandum and a Notice of Change of Status, Graduate Form #2, to the Office of the Registrar. The memo should clearly note which of the Old Dominion University credits and approved transfer credits may be applied to the master's degree, and which, if any, should be reserved for future doctoral work.

Normal Course Load

Every graduate program of study requires prior approval of the graduate program director or the approved faculty advisor. The minimum load for a full-time graduate student is nine graduate credit hours per semester. No more than 12 credit hours may be carried, except in unusual circumstances and with the permission of the graduate program director. In summer sessions, six credit hours constitute a full load.

Unsupported graduate students registered for fewer than nine credit hours during regular semesters or fewer than six credit hours in summer sessions are classified as part-time graduate students. During regular semesters, six credit hours is considered three-fourths time, four credit hours is half-time, and three credit hours is quarter-time. During the summer term, four credit hours is considered three-fourths time, three credit hours is half-time, and one hour is quarter-time.

Graduate students who are appointed as teaching, administrative or research assistants who are supported by University/Commonwealth funds shall register for and complete a minimum of nine hours of graduate course work per semester and three hours in the summer. Those graduate students who are appointed as teaching, administrative or research assistants who are supported by other funding sources must register for and complete a minimum of six hours of graduate course work per semester and three hours in the summer. Doctoral assistants who have successfully advanced to candidacy and need only to complete the dissertation, must register for at least one hour of dissertation (899) to be classified as a full-time graduate student and therefore eligible for full tuition exemption (see the Financial Aid section of this catalog).

Course-Load Distribution

Graduate students should take care that the major portion of their course work is selected from 600- and 700-level offerings in pursuit of the master's degree and from 800-level offerings for an education specialist or doctoral degree. At least three-fifths of the course work must be completed at these levels, and some programs have instituted more stringent requirements. Reference should be made to the appropriate section herein, and individual questions concerning the course-load distribution should be directed to the advisor.

Submission of Written Work To More Than One Class

In general, it is not acceptable for a piece of work such as a term paper to be submitted to more than one class for credit. In cases where submission of the same paper is appropriate, prior approval must always be obtained.

An example of a situation in which the same paper might appropriately be submitted would be one in which a student was enrolled in two classes, in both of which a given research topic was not only of interest to the student but was completely appropriate to both classes. In such circumstances, the student would approach the instructors of the two classes and obtain approval to submit the same term paper to both classes, based on prior agreement concerning the depth of the study, amount of material covered, and the length of the paper to be submitted (which should be longer than a paper submitted to one class).

Validation of Out-of-Date Graduate Credit

Academic credit granted outside the time limit established for graduate degrees (six years for master's and education specialist degrees and eight years for doctoral degrees) must be validated by an examination before the work can be applied toward the requirements of a degree program.

To be validated, the work must have been completed at Old Dominion University or be acceptable as transfer credit in lieu of an Old Dominion University course.

The following procedure shall be used to validate out-of-date work:

1. The student must receive the permission of his or her graduate program director and the chair of the department/school or dean of the college in which the course is offered to validate the course credit. The form for validation of out-of-date credit shall be used to record all transactions. Graduate Form 5 must be submitted to the Registrar's Office upon completion of validation of work.
2. The graduate program director, department/school chair or dean shall make appropriate referrals to faculty member(s) (an individual or a committee) teaching the course to request that an examination be prepared and evaluated. Before the examination, the faculty member(s) shall inform the student of the area of knowledge or course content on which he or she is to be examined.

3. After the examination has been completed, the validation form shall be filled out, signed by the examining faculty member(s), and forwarded to the dean of the academic college offering the graduate degree program for approval.
4. Copies of the completed form shall be sent to the student, the graduate program director, and the university registrar.
5. Validation for any given course can be sought only once.

Final Examinations

The University firmly believes that a comprehensive evaluation of a student's achievement in a course is a vital part of the educational process. Final examinations, if given, are to be given at the time and in the location given on the Registrar's Office website at www.odu.edu/registrar. Upon request of the instructor, exceptions to this regulation may be made only by the dean.

In the event that a final examination is changed to other than that of the scheduled time, provisions will be made by the instructor for any student who cannot comply with the schedule change.

Any student who has three examinations scheduled in one calendar day and is unable to resolve the problem informally with the instructor or instructors may petition the dean for relief.

All examinations are to be retained for one year by the faculty members. Students have the privilege of requesting conferences with the instructors in regard to their final grades.

Students enrolled in asynchronous, video streaming, CD Rom, or like courses that may not follow the traditional semester timetable will be required to adhere to the examination schedule set by the professor. In addition, students not associated with a distant learning site, higher education center, or with main campus will need to secure a Proctor to administer all tests, quizzes, and final exams. A postal fee will be incurred by the student for this service. For more information on proctoring, contact the Office of Distance Learning at 1-800-968-2638.

Probation and Suspension (Continuance)

The requirements and regulations set forth above are to be construed as the minimal requirements established by the University. Students also are obligated to meet all additional requirements established by the appropriate graduate program.

Students who believe the probation or suspension was due to an error in a grade assigned should contact the Office of the University Registrar.

Degree Seeking Students

At the end of each semester-fall, spring, and summer- the records of students who do not maintain a 3.00 cumulative grade point average (GPA) are reviewed. Students who do not have a cumulative GPA of at least 3.00 will be placed on probation.

Probation/Suspension Policy

Graduate students on probation will have 12 credit hours to raise their cumulative GPA to 3.00. If they fail to achieve a cumulative GPA of 3.00 after completing the next 12 credit hours, they will be placed on indefinite suspension and prevented from enrolling in graduate courses. This does not affect the student's status with regard to undergraduate courses.

Reinstatement Policy

The following conditions must be satisfied before reinstatement is authorized:

1. The student is responsible for initiating each of the following aspects of the request for reinstatement to the university:
 - a. Developing a plan of study in concert with and approved by the appropriate Graduate Program Director (GPD) of the program that the student is seeking to either continue enrollment or to be newly admitted. The plan of study must specify the initial 12 credit hours to be taken and the steps necessary to complete the degree requirements within the six-year (Masters) and the eight-year (doctoral) time period as required by University policy. This plan should recognize that all prior courses in which grades of B- or less were earned must be repeated or replaced, and, that a grade point average of at least 3.00 be achieved in the first 12 credit hours attempted after reinstatement or admission.

- b. Provide to the GPD and Graduate Appeals Committee written explanations and documentation of the factors and circumstances that contributed to the failure to achieve the academic standards as well as evidence that these issues have been resolved. Students who wish to maintain confidentiality regarding special medical or psychological issues must obtain a letter from the Vice President for Student Affairs certifying their validity and contribution to the suspension and that these issues have been or will be satisfactorily resolved prior to reinstatement or admission.
 - c. Provide a letter from the GPD indicating the program's desire to reinstate or admit the student. The GPD must indicate the reasonableness of: i) the proposed plan of study; ii) an assessment of the potential for successful completion of the program; and, iii) the potential impact of reinstatement on departmental resources.
2. The Graduate Appeals Committee shall review these materials and the student's formal written request and decide if there is sufficient reason to reinstate based on (1) the recommendation of the GPD and department; (2) the student's statements regarding past grades as well as documentation that there were valid extenuating circumstances that contribute to the poor performance and that these have been satisfactorily eliminated or addressed; (3) the student's credentials, and (4) the plan of study approved by the GPD.
3. If the Graduate Appeals Committee approves reinstatement, all courses with grades of B- (2.70) or below will be dropped from consideration in the calculation of the grade point average for continuance or graduation. These grades will remain on the student's transcript, but the courses will not be counted toward a degree.
4. Reinstated students must achieve a GPA of at least 3.00 in the next 12 hours of credit attempted. Subsequent performance will be monitored by the GPD. A student may be reinstated only one time.

Non-degree Students

Certificate and Licensure Program Students

Probation /Suspension Policy

Students who have been permitted to pursue a certificate or licensure program must achieve a cumulative GPA of 3.00 after six or more credit hours of graduate coursework. If they fail to do so will be placed on probation and must raise their cumulative GPA to 3.00 within the next six credit hours. Students who fail to achieve a cumulative GPA of 3.00 after completing the additional six credit hours will be indefinitely suspended and prevented from enrolling in graduate courses. This does not affect the student's status with regard to undergraduate courses.

Reinstatement Policy

A suspended certificate or licensure student seeking reinstatement should follow the procedures outlined earlier in this policy under Reinstatement Policy for Degree Seeking graduate students.

Life-long Learners

Probation/Suspension Policy

Students who have not been formally admitted into a degree granting program, a certificate or licensure program but desire to take graduate courses are defined as *life-long learners*. Life-long learners must achieve a GPA of at least 3.00 after six credit hours. Students who fail to achieve a 3.00 after completing an additional six credit hours will be indefinitely suspended and prevented from enrolling in graduate courses. This does not affect the student's status with regard to undergraduate courses.

Reinstatement Policy

A life-long learner who has been suspended from graduate study must formally apply and be admitted into a degree program, a certificate or a licensure program before being allowed to take additional graduate courses.

University Requirements for Graduate Degrees

Completion of Requirements

Graduate students who complete their master's or education specialist degree requirements within six years, and doctoral students who complete degree requirements within eight years, following admission to Old Dominion University will qualify for the degree by fulfilling the requirements in the catalog in effect at the time of their first enrollment. (See military service exception under Requirements for Graduate Degrees.) Students (including part-time) who do not complete their graduate degree requirements within these time periods must project their graduation and fulfill the requirements in the catalog in effect during any of the six or eight years, respectively, preceding graduation. If a catalog other than the catalog of the year of initial enrollment is to be used, written permission of the graduate program director and dean must be obtained. Graduate students should consult their advisors to determine if any out-of-date credits may be validated by examination.

In all cases, students must have been duly admitted to the University and an academic program of study and meet all of the requirements for graduation in one catalog. Students may not create their own degree requirements by selecting partial requirements from more than one catalog.

Graduate Assessment Requirement

Old Dominion University has developed an institution-wide plan to assess the quality of its graduate academic degree programs. In addition, students are asked to assess their experiences with support services, University administration, and other aspects of their University experience. Students will complete the assessment at the end of their graduate degree program.

Prior to the completion of degree requirements, all graduate students must complete their assessment. Students will receive advanced notice of their eligibility to complete the measures, which may be accessed through the University's site on the World Wide Web. Failure to complete the assessments normally precludes the student's right to receive his or her graduate degree. Assessment results are used to improve student learning and the educational experience at Old Dominion University, and they do not become part of students' records. Confidentiality is assured, as only aggregate data are reported and used in analyses.

Master's Degree

This section specifies the minimum requirements for a master's degree from Old Dominion University. Some colleges, schools and departments have requirements in addition to the requirements described below. In seeking a master's degree, each master's student accepts responsibility for the following University requirements as well as any imposed by the major department.

The master's degree is awarded in recognition of the candidate's command of a comprehensive body of knowledge and ability to perform productively in the field of study. All master's degrees require a minimum of 30 semester hours of graduate credit. No more than 12 credit hours taken at other institutions may be counted toward a master's degree at Old Dominion University. All requirements for a master's degree must be completed within a six-year period. Exceptions to these time limits must be approved by the graduate program director, the college dean, and the vice provost of graduate studies and research. Academic credits older than six years at the time of graduation must be validated by an examination before the work can be applied to a master's degree. See the "Policy on Validation of Out-of-Date Graduate Credit." Students whose graduate study is interrupted by military service will be granted an extension of time for the period of their military service, not to exceed five years.

Candidates for the master's degree at Old Dominion may have the choice of two options: the thesis option or the nonthesis option. The choice will depend upon the availability of the two options within the selected discipline, the professional interests of the candidate, and the advice and approval of the appropriate graduate program director.

Thesis Option

A minimum of 30 semester credits is required, including 24 semester credits in approved course work and six semester credits in research. The candidate is required to prepare and present a thesis or equivalent creative work. A final oral examination covering the research is required. A comprehensive written and/or oral examination covering the program of study may be required.

Nonthesis Option

A minimum of 30 semester credits of approved course work is required, including one or more courses at the conclusion of study that deal directly with special topics and/or training related to current problems or research in the discipline. A comprehensive written and/or oral examination, or an approved equivalent, on the program of study is required.

Student Advising

The Master's Degree. The graduate program director in consultation with the student, will assign a graduate advisor who must be certified for graduate instruction. An annual evaluation may include student's performance in courses, assistantships (teaching, research), the development and re-evaluation of his/her plan of study, guidance in selecting projects and mentors, preparation and scheduling of qualifying/comprehensive or equivalent exams, time management, and obtaining employment or further education. The advisor's annual evaluation and recommendation will be shared with the student and the graduate program director.

Program of Study

Prior to completion of 12 semester hours, the degree candidate is required to prepare a program of study with the guidance of the advisor. The purpose of the program of study is to ensure that the student organizes a coherent, individualized plan for the course work and research activities. The program of study is to be consistent with the requirements for the degree as described in the catalog and must be approved by the graduate program director. The successful completion of the program of study, along with the collateral reading, research, practica, etc., will enable the student to demonstrate the high level of professional competence required of all graduate students in their respective fields.

Master's Examination

A comprehensive written examination and/or oral examination, or its equivalent, is required under the nonthesis option and, depending on the program, may be required under the thesis option. The examination tests the candidate's competence in the fields covered by the program of study. The nature of the master's examination will depend on the degree sought and the requirements of the major department and examining committee. A program may propose, through the appropriate college graduate committee and academic dean, replacing the master's examination with an equivalent requirement. Such equivalent requirements shall be approved by the vice provost of graduate studies and research. For further information, the student should consult the section on requirements under each degree program.

The examining committee is appointed by the graduate program director with appropriate notification to the student. The examining committee is composed of a minimum of three members who may or may not be those who serve as advisors or members of the thesis advisory committee. Members are expected to be certified for graduate instruction in the major department/school and college. This examination may not be scheduled until all major requirements have been satisfied except the final semester completion of the course work and/or the thesis.

The results of the examination must be received in the Office of the Registrar at least two weeks prior to the end of the semester. In order to pass the final examination or approved equivalent, a master's degree candidate must have a favorable vote from a majority of the examining committee. A student who has failed the examination may repeat it once but no earlier than the next regularly scheduled examination. Students who fail the comprehensive examination twice cannot subsequently elect a thesis option. At the discretion of the graduate program director, a student who passes the examination but does not graduate within twelve months may be required to repeat the examination.

Thesis Advisory Committee

The graduate program director, in consultation with the student, appoints a thesis advisory committee of at least three graduate faculty members with the backgrounds and interests necessary to counsel, direct, and evaluate the proposed research and progress toward completion of the program of study.

Nonfaculty personnel may be recommended for inclusion on a graduate thesis advisory committee. Such personnel should meet the current standards of academic training and research experience expected of faculty members serving on such committees. If the nonfaculty personnel are to be voting members of the advisory committee, approval of the inclusion of such personnel should be sought by the graduate program director through petition to the appropriate academic college dean, citing the particular advantages of such a nomination. In all cases, the committee chair must be a resident graduate faculty member.

Thesis

The candidate for the master's degree whose program of study includes a thesis is required to prepare and present a thesis (or equivalent in creative work) acceptable to the thesis director and committee, the graduate program director, and the appropriate academic dean. The thesis must represent in content and methods the skills, disciplines and knowledge required for graduate study, including competence in written language. The character of the final work must testify to the distinction of the student and standards of the University. The thesis or equivalent creative work must be worthy as a culminating experience for graduate study. Candidates will be required to defend the thesis in an oral examination. Graduate Form 6 (Thesis/Dissertation Acceptance and Processing) must be submitted to the Office of the Registrar upon completion of Part A of this form. Graduate Form 11 (Thesis/Dissertation Delivery) must accompany Graduate Form 6.

The candidate should consult the Guide for Preparation of Theses and Dissertations available from the Office of Graduate Studies' web site.

Change From Thesis to Nonthesis Option

A student who wishes to change from the thesis option to the nonthesis option for the master's degree must obtain the permission of the thesis advisory committee and the graduate program director. The permission must be forwarded to the Office of the Registrar prior to the last semester for the intended graduation using Graduate Form 24 (Change from Thesis to Nonthesis Option). The candidate must meet all requirements of the nonthesis option. A maximum of three credits earned in thesis research can be counted toward the degree requirements for the nonthesis option. The thesis advisory committee must indicate that the thesis research work was productive in and of itself and warrants credit as a special problem or special topics course.

Departmental Requirements

Individual colleges and/or programs may establish requirements above and beyond those set by the University as minimum. Students are obligated to follow the requirements of the appropriate graduate program section of the catalog in effect at the time of their first enrollment for this degree.

Education Specialist Degree

The Education Specialist degree (Ed.S.) normally is granted at the end of the sixth collegiate year of study and as such falls between the master's degree and the doctorate in time; however, it is not necessarily viewed as intermediate between the two degrees. The education specialist degrees provide advanced professional preparation for various positions in education.

For admission to an education specialist program, the University requires a master's degree from an accredited institution and a minimum grade point average of 3.00. Some programs have additional requirements such as a minimum Graduate Record Examination (GRE) aptitude score, grade point average, and graduate courses in specific areas.

The education specialist degree requires a minimum of 30 semester hours of graduate credit beyond a master's degree. A program may range from 30 to 39 hours, depending on the background and needs of the student. All requirements for the degree must be completed within a six-year period. Students must pass a written comprehensive examination and satisfy research requirements. Specific course requirements are found in the appropriate section of this catalog.

Doctoral Degrees

Old Dominion University offers three doctoral degrees: Doctor of Physical Therapy (D.P.T.), Doctor of Psychology (Psy.D.) through the Virginia Consortium Program in Clinical Psychology, and Doctor of Philosophy (Ph.D.).

Doctor of Physical Therapy

Old Dominion University offers a professional doctorate degree in physical therapy (D.P.T.) that provides individuals with the knowledge, skills, and clinical internship experiences required to sit for licensure in any jurisdiction in the United States. This curriculum is comprised of a series of required didactic and clinical education courses prescribed in a specific sequence that offers students the knowledge, professional skills and competencies necessary for entry into the practice of physical therapy. In the place of a dissertation, each student is required to develop a selected case study based upon the observations of a patient examined and treated during one of the clinical internships, a research proposal, and a research project with platform and poster presentations. In addition to satisfactorily completing the didactic and clinical education curriculum, students must pass both written and oral comprehensive examinations prior to graduation.

The curriculum consists of 117 credit hours over a three-year, nine-semester period of time including summers. There are five full-time clinical internships in the three years of study totaling 40 weeks. For details on admission and program requirements see the School of Physical Therapy section of this catalog.

Doctor of Psychology

The Department of Psychology participates in a program that awards the Doctor of Psychology (Psy.D.) in clinical psychology. The emphasis of the program is on the training of highly skilled clinicians who will work in those areas of society where mental health care needs are not being met by the present system. The program is fully accredited by the American Psychological Association. The program consists of a minimum of four years of post-baccalaureate training. The curriculum involves a specific sequence of required courses to ensure mastery of the knowledge and skills necessary for professional competence. The first two years (six semesters) provide for an intense program of basic behavioral science and clinical courses and practica. In the third year, course work includes technology in mental health care administration, practica, and concentration courses. The other main activity is the doctoral dissertation. The one-year full-time clinical internship is completed during the fourth year. **For details on admission and program requirements, contact the Virginia Consortium Program in Clinical Psychology Office, Pembroke Two, Suite 301, 287 Independence Blvd., Virginia Beach, Va 23462; telephone: (757) 518-2550.**

Doctor of Philosophy

Programs leading to the Ph.D. are designed to help superior students develop the capability to become creative leaders in their chosen fields. The degree is awarded upon mastery of the subject area, the development of appropriate research skills, and a concentration of knowledge in the field of specialization.

It is important to recognize that the attainment of this degree is not a matter of accumulating course credits and satisfying residency and language or research skill requirements, even though minimum requirements for these categories are set forth by the University. The final basis for granting the degree shall be the candidate's knowledge of the field of study and his or her demonstrated ability to do independent, original, scholarly research.

Each graduate program is responsible for setting out the requirements and procedures appropriate to its area of study. The requirements and regulations set forth below are to be construed as the minimal requirements established by the University. Students also are obligated to meet all additional requirements established by the appropriate graduate program.

Prerequisites for Admission

The applicant must complete the appropriate application for admission, submit official transcripts of all college- or university-level work, and supply letters of recommendation and official results of test scores as specified by the individual program. Baccalaureate and post baccalaureate work must reflect superior performance.

Minimum Requirements

Minimum degree requirements for the Doctor of Philosophy which must be considered in preparing the preliminary plan of study are:

1. Satisfactory completion of at least 48 semester hours of post-master's course work, including the dissertation or equivalent level of performance course work;
2. Demonstrated competency in research skills as required by

- the specific graduate program;
3. The passing of written and oral candidacy examinations at the end of the program of course work;
 4. The completion of a dissertation representing independent, original research worthy of publication in a refereed scholarly journal; and
 5. The successful oral defense of the dissertation before an appropriately selected committee of faculty knowledgeable in the field of the dissertation research.

Time Limits

All requirements for a doctoral degree must be completed within eight calendar years from the date of beginning the initial course following admission to the doctoral program. Exceptions to these time limits must be approved by the graduate program director, the college dean and the Vice Provost for Graduate Studies. Academic credits older than eight years at the time of graduation must be validated by an examination before the work can be applied to a doctoral degree. See the "Policy on Validation of Out-of-Date Graduate Credit." Students whose graduate study is interrupted for military service will be granted an extension of time for the period of their military service, not to exceed five years.

Student Advising

The Doctoral Degree. Before completion of nine semester hours, the graduate program director, in consultation with the student, will assign a program advisor or advisory committee. The advisor or advisory committee members must be certified for graduate instruction and will meet with the student to evaluate student's academic progress. Among the advisor's/advisory committee's responsibilities are a review of student's performance in courses, assistantships (teaching research), the development and reevaluation of his/her plan of study, guidance in selecting projects and mentors, preparation and scheduling of qualifying/comprehensive or equivalent exams, time management, and obtaining employment or further education. These annual evaluations are signed by the advisor/advisory committee and the student. The evaluation is filed in the student's record and a copy given to the graduate program director.

Before completion of nine semester hours, the graduate program director, in consultation with the student, will assign a program advisor or advisory committee. The advisor or advisory committee members must be certified for graduate instruction and will meet with the student at the end of each semester to evaluate student's academic progress. Among the advisor's/advisory committee's responsibilities are a review of student's performance in courses, assistantships (teaching, research), the development and re-evaluation of his/her plan of study, guidance in selecting projects and mentors, preparation and scheduling of qualifying/comprehensive or equivalent exams, time management, and obtaining employment or further education. These annual evaluations are signed by the advisor/advisory committee and the student. The evaluation is filed in the student's record and a copy given to the graduate program director.

Plan of Study

Before completion of nine semester hours, the student shall prepare a plan of study with the aid and approval of the advisor or advisory committee. The plan of study also should be approved by the graduate program director to ensure that it meets established requirements. Failure to present the plan on time may prolong the period of study for the degree. Before drawing up and approving the plan the graduate program director should verify that there is on file a set of transcripts of all undergraduate and graduate work the student has taken. When appropriate, a diagnostic examination also may be used in developing a plan of study.

The successful completion of all work indicated on the approved plan of study is a fundamental prerequisite to the granting of the degree.

Residence*

An essential feature of doctoral study is the provision of total concentration on the field of study for significant periods of time. Students who wish to pursue a part of their doctoral study on a part-time basis may do so, but all doctoral students shall spend at least two semesters engaged in full-time graduate study. This requirement may be filled during the regular fall and spring semesters or during the summer.

*Policy under review. Student must adhere to program/college requirements.

Research Skills

Program skill requirements reflect the University's expectations of one or more significant skills distinct from the dissertation but fundamental to doctoral and postdoctoral research. Specific skill requirements vary with programs. Traditionally, a reading knowledge of one or more foreign languages has been required; more recently a demonstrated proficiency in computer science or quantitative methodology has been introduced.

Under University policy, each academic program leading to the Doctor of Philosophy establishes its own requirements for research skills. Responsibility for the level of competency, the nature of validating the competencies, and the standards utilized in the evaluation rests with the department/school that offers the program. Descriptions of individual programs should be consulted for appropriate regulations and procedures. Information about schedules of examination, standards, and general procedures is available from all departments/schools and graduate program directors.

The research skills requirement must be met before taking the candidacy examination. For specific information, the student should consult the appropriate program, school or college.

Candidacy Examination

The written and oral examinations qualifying a student for candidacy for the degree of Doctor of Philosophy are comprehensive in nature. The graduate program director is responsible for coordinating the administration of the written and oral candidacy examinations and will appoint a committee to administer the exams. The examination committee will be made up of at least three faculty members, all of whom must be graduate certified. Before taking the qualifying examinations, the student must meet the appropriate departmental, school and college requirements and have the recommendation of the advisor or advisory committee. The examinations are taken near the end of the student's coursework. The candidacy examinations are usually taken during the semester in which the last formal graduate courses listed in the study plan are taken.

When the student and the advisor or advisory committee have determined that the examinations should be taken, the student should obtain a Request for Permission to Take the Ph.D. Candidacy Examination (Graduate Form 15) no later than one month before the date of the first examination. The student should secure the signature of the advisor or advisory committee and submit the form to the graduate program director, who will verify that the student meets the prerequisites for the candidacy examinations. The graduate program director should be consulted on the schedule of the examinations. Once permission has been granted, postponement of the examinations must have the approval of the graduate program director.

After successful completion of the written examination, an oral examination, which must be taken prior to the end of the next semester, is given addressing topics discussed in the written examination and possible additional materials. The oral examination is a serious and integral part of the qualifying procedure.

A student must pass both the written and oral candidacy examinations. The written examination must be passed before the oral examination may be taken. For either the written or oral examination, more than one negative vote from the examining committee will result in a failure. A failed written examination must be retaken successfully within one year. A student who passes the written examination on the first attempt need not repeat the written exam in the event of failing the oral exam. A failed oral exam, which also may be attempted a second time, must be retaken prior to the end of the next semester.

Neither the written nor the oral examination can be passed conditionally. A pass cannot be made contingent upon doing extra courses, additional projects, etc.

The examination committee will report, in writing, to the graduate program director and the dean the results of the examinations.

Students must be registered in any semester in which they are scheduled to appear for the examination.

Dissertation Committee

After the candidacy examinations have been passed, the dissertation committee is formed to supervise the dissertation research. Faculty who agree to serve on a dissertation committee understand that they are committed to serve until the dissertation is completed. The committee must have approval of the graduate program director and the college dean using Graduate Form 16 (Ph.D. Dissertation Committee). Replacement of the dissertation committee chair or any other substantial change in the composition of the dissertation committee initiated by the student requires that the reconstituted dissertation committee re-evaluate and re-approve the dissertation prospectus. The

committee should have at least three Old Dominion University faculty members; one faculty member must be from outside the major department/school. The chair must be certified for graduate instruction and be an authority in the field of specialization of the proposed dissertation. Committee membership may be extended to a non-University person with special knowledge of the dissertation subject area. Voting privileges can be provided such specialists upon the recommendation of the chair and approval of the graduate program director and the college dean. No more than one-third of the committee's membership can be individuals external to the University. Adjunct faculty members who are certified for graduate instruction may be appointed as voting members of the committee upon the recommendation of the director of the dissertation committee and approval of the graduate program director and the college dean. The dissertation and the final oral defense of the dissertation must have the majority approval of the dissertation committee.

Change in Dissertation Committee

Changes must be made in advance of the oral dissertation defense. Changes made in the dissertation committee are made only with the approval of the graduate program director and the college dean.

Advancement to Candidacy

Advancement to candidacy is a formal step that occurs after the student has (1) passed the Ph.D. written and oral candidacy examinations, (2) filed an approved dissertation proposal, and (3) completed formal course work. In some colleges advancement to candidacy may be equivalent to "all but dissertation" (ABD) status. Please check with the appropriate graduate program director for further information.

Dissertation Preparation

General regulations and procedures governing the submission of a doctoral dissertation are given in the Guide for Preparation of Theses and Dissertations. Full information, including detailed procedures and qualifications for undertaking a doctoral dissertation, is available in the student's major/school and should be obtained by the student and the dissertation advisor at the beginning of the planning for research and writing of a dissertation.

After approval of the dissertation proposal, the chair of the dissertation committee shall recommend the student's admission to candidacy to the graduate program director and the dean.

Oral Dissertation Defense

The format of a defense is determined by the dissertation committee with the approval of the graduate program director. The defense is chaired by the chair of the dissertation committee. The chair will act as moderator, ruling on questions of procedure and protocol that may arise during the defense. The chair of the defense represents the college dean, to whom he or she makes a complete and prompt report on the defense. The chair should also promptly notify the graduate program director of the results of the defense.

The oral dissertation defense is scheduled for the time and place approved in the request for the dissertation defense. A two-week lead time is required for scheduling. This information is published in the appropriate University news media. The oral dissertation defense is open to the University community; all interested members are encouraged to attend the examination.

The aim of the defense is to explore with the candidate the methodological and substantive contributions of the already approved dissertation. Majority approval by the examiners constitutes successful completion of the defense of the dissertation. In case of failure, the dissertation committee may recommend that the candidate be dropped or be allowed re-examination no earlier than three months after the first examination.

Satisfactory performance on this examination and adherence to the regulations outlined above complete the requirements for the degree. Graduate Form 6 (Thesis/Dissertation Acceptance and Processing) and Graduate Form 11 must be submitted to the Office of the Registrar with the completed dissertation upon completion of requirements for the degree.

Dissertation Load Registration and Leave of Absence

All doctoral students who have advanced to candidacy are required to be continually registered for an appropriate number of dissertation units during each semester and summer session. (See "Graduate Student Registration Requirement".)

A candidate who finds it necessary to be excused from registration for a semester must report formally, before the beginning of the semester, to the dissertation committee and the graduate program director and request by petition a leave of absence using Graduate Form 27 (Permission to Take a Leave of Absence from Graduate Studies). A leave of absence may not exceed one year and may not be repeated. During a leave of absence, the candidate will not be entitled to assistance from the dissertation committee or to the use of University facilities. The granting of leave of absence does not change the candidate's responsibility for meeting the time schedule for the completion of degree requirements.

Thesis and Dissertation Procedures

Graduate students who plan to write theses or dissertations should obtain copies of the Guide for Preparation of Theses and Dissertations from the Office of Graduate Services web site for use in conjunction with any style manual preferred or required by their respective departments/schools or colleges. Minimum University requirements for the preparation of theses and dissertations are contained in the guide; departments/schools and/or colleges may set additional requirements.

Information regarding compliance with policies regulating research involving human subjects, animals, radiation, potential biohazards (e.g. recombinant DNA), lasers, controlled substances, or hazardous materials and policies regarding intellectual property can be found on the Office of Research web site at www.odu.edu/ao/research/IP-Main.htm.

All research involving human subjects, animal care and use, radiation, potential biohazards, lasers, controlled substances, or hazardous materials requires the approval signature of the appropriate review committee chair or designee, or safety officer, prior to the initiation of any research activities.

Students should be aware that in most cases, the University owns intellectual property created with University resources and can claim an interest in the intellectual property. Intellectual property must be disclosed to the Office of Research using an invention disclosure form. In order to fulfill its contractual obligations, and to adhere to the Policy on Patents and Copyrights, it may be occasionally necessary for the University to temporarily delay publication of a thesis or dissertation that contains potentially patentable information in order to ensure the availability of worldwide patent protection. Such situations would arise when a faculty member directing the research, under his/her duty as a University employee, discloses potentially patentable subject matter to the Office of Research. A student's degree requirements can still be fulfilled even though publication of the thesis or dissertation is delayed.

Presentation of a thesis or dissertation in partial fulfillment of degree requirements necessitates submission of the finished original work to the dean of the college for final approval, following oral defense and signature approval by the thesis/dissertation committee and graduate program director. Approval of the dean of the college should be obtained prior to reproduction of the original work, in the event corrections need to be made.

Upon final approval, the student must arrange for reproduction of four additional copies of the thesis or dissertation, for a total of five for submission to the Office of the Registrar for binding. Certain doctoral programs require more than five copies; students should consult appropriate graduate program directors.

A final, approved, error-free original and four copies (more are required by some programs) of the thesis or dissertation must be received by the Office of the Registrar no later than the day prior to the beginning of the final examination period; that is, the last day of classes of the semester in which the degree will be taken. The completed document, approved by the dean, and copies should be accompanied by the following forms: Binding Fee Receipt, Thesis/Dissertation Acceptance, Results of the Comprehensive Examination, and Thesis/Dissertation Delivery. The date on the title page of the thesis/dissertation should be within the same semester that the student intends to graduate.

A microfilming fee is also required of dissertation writers; a copyrighting fee is optional.

The student may order additional copies of the thesis or dissertation by making payment to the Office of Finance at the same time the required copies are ordered.

Experiential Learning Credit Options at the Graduate Level

Old Dominion University offers a program for assessing college-level knowledge gained through work and life experience and self-study. Students should meet with their advisors, site directors, or distance learning

representative to determine how experiential learning credit affects their degree planning. A student may earn a maximum of six semester hours at the graduate level through the following mechanisms:

1. **Knowledge-based examinations.*** Upon approval of the student's graduate program director and the appropriate chair and/or dean of the college involved, a student may take a knowledge-based examination, and with a satisfactory score, receive academic credit for the course(s).
2. **External examinations.** Upon approval of the student's graduate program director and the appropriate chair and/or dean of the college involved, a student may submit satisfactory scores of professional examinations that are evaluated and recommended for graduate-level credit by the American Council of Education, and receive academic credit for the relevant course(s).
3. **Credit for training.** Upon approval of the student's graduate program director and the appropriate chair and/or dean of the college involved, a student may submit documentation of completion of professional and/or military training that is evaluated and recommended for graduate-level credit by the American Council on Education, and receive academic credit for the relevant course(s).
4. **Portfolio development.** Upon approval of the student's graduate program director and the appropriate chair and/or dean of the college involved, a student may develop a portfolio for a graduate-level course(s) offered by Old Dominion University to earn academic credit. Portfolios are submitted to the Office of Experiential Learning and assessed for credit by the appropriate department and/or college involved. For further details on the procedure and fees for portfolio development, see the section of this Catalog on Experiential Learning Credit Options at the Undergraduate Level.

The following regulations for experiential learning credit apply:

1. Experiential learning credit be granted upon the written recommendation of the student's graduate program director and the chair of the department/school (or designated faculty assessor) having jurisdiction over the courses involved.
2. Applicability of experiential learning credit toward a specific degree program is subject to departmental/school approval.
3. A student may not receive credit for the same course in which any grade has been previously awarded, including W (withdrawal), F (fail), or O (audit).
4. No letter grades be entered on the student's transcript for experiential learning credit, but that this credit be treated in the same way as transfer credit with "Pass" (P) and not be counted in the student's grade point average.
5. A student request experiential learning credit as early as possible upon admission to degree status. A student must meet with the degree program advisor and the director at the beginning of his or her academic career at Old Dominion University to determine how the experiential learning program may be applicable to the degree.
6. Satisfactory scores for knowledge-based examinations and professional examinations are determined by the appropriate department/school and/or dean of the college involved.
7. Necessary documentation for academic credit for professional training is determined by the appropriate department/school and/or dean of the college involved.
8. A maximum of six semester hours of graduate credit may be earned through experiential learning mechanisms. The six hours is included in the maximum number of graduate credits that may be transferred into a graduate program at Old Dominion University. Experiential learning credit does not count toward the University's residency requirement. The student must meet the minimum residency requirements of Old Dominion University and program requirements of the degree. The student must be aware of individual degree program requirements.
9. A student in a certificate or endorsement area may earn a maximum of six credit hours through experiential learning credit to apply to a certificate, endorsement or teacher licensure program. Experiential learning hours gained in these programs would be applicable to approved degree programs at Old Dominion University. In an approved graduate degree program at Old Dominion University, a graduate student who has earned six credit hours in a certificate or endorsement program that is applicable to the degree program has met the maximum number of experiential learning credit hours. No additional experiential learning credit may be applied to that graduate degree program.

Graduate Credits by Transfer

A maximum of 12 semester hours of graduate credit may be applied into a graduate degree program from graduate credits earned as a nondegree graduate student at Old Dominion University. An additional combined maximum of 12 credits may be transferred into a graduate degree program from graduate credits earned through experiential learning credit options and graduate credits earned at another accredited institution. Exceptions are allowed in the case of an approved interinstitutional program.

Transfer credit will be given only for those courses that are certified as being applicable toward a comparable degree or certificate at the institution that offered the courses, and that were completed with a grade of B or better. Specifically, in-service courses that are established especially for groups of teachers and are not intended by the home institution to be part of a degree program will not be acceptable for transfer at Old Dominion University. Exceptions to this regulation may be made only with the approval of the graduate program director involved, the dean of the college, and the vice provost of graduate studies and research. In case of doubt, it is the responsibility of the student to show that the course in question would be acceptable toward a comparable degree at the home institution.

No credit toward a graduate degree may be obtained by examination (except through the experiential learning options noted above) or correspondence study.

A student who wishes to transfer credit earned prior to admission to a degree program at Old Dominion University must submit a special request for evaluation of transfer credits through the graduate program director to the Registrar's Office. Following admission to the degree program, the student should obtain written permission from the graduate program director before registering for a course at another institution with the intention of transferring the credit for that course toward a graduate degree at Old Dominion University.

In no case is a transfer of credit final without the signed approval of the graduate program director and the academic dean on the Evaluation of Transfer Credits Form.

Evaluation of Transfer Credits

In the case of a student who has changed programs of study at Old Dominion University, the graduate program director of the new program may or may not accept any previously transferred course work or work completed in the former programs.

Credits accepted for transfer from another institution will satisfy partial hour requirements, but grades earned in such courses are not calculated in the student's overall grade point average.

No credits will be accepted toward the degree or certificate if more than six years old (eight years for doctoral application), unless properly validated by examination.

Certificate of Recognition or Achievement for Terminally Ill and Deceased Students

When a student has completed all degree requirements but dies before graduation, the university awards the degree posthumously.

Certificate of Recognition. In those instances when a student who is close to completing a degree is terminally ill or dies before completing the degree, the university may award a Certificate of Recognition. The following criteria must be met for receiving the Certificate of Recognition. Any exceptions must be approved by the president.

Graduate Students

1. The student must be degree seeking.
2. The student must have completed at least 75% of the requirements for the degree (for the master's student this will be a minimum of 24 credits; for the doctoral student this will be a minimum of 36 credits).
3. The student must be in good academic (3.00 GPA) and disciplinary standing.
4. The student must be enrolled at ODU at the time of death or diagnosis of terminal illness.
5. The dean of the appropriate college recommends the award of the certificate.

Certificate of Achievement. In those instances when a student is terminally ill or dies before completing the degree but does not qualify for a Certificate of Recognition, the university may award a Certificate of Achievement. The following criteria must be met for receiving the Certificate of Achievement. Any exceptions must be approved by the president.

Graduate Students.

1. The student must be in good academic (3.00) and disciplinary standing.
2. The student must have completed the equivalent of two semesters of full-time study (18 credits) at Old Dominion University.
3. The student must have died or been diagnosed with a terminal illness within 12 months of the last registration.
4. The certificate may be recommended by a faculty member or at the request of others, but the next of kin must approve.
5. The president or delegate will communicate with the next of kin.
6. The certificate will be presented only to the next of kin or their delegate.

Campus Services and Student Information

CMC for this initiative with the Chevron Corporation Award as the most innovative career center in the country.

More information is available 24/7/365 Live by calling the Virtual Career Assistants at 800-937-ODU1 or virtually via the internet at www.odu.edu/cmc. During normal working hours please call 757-683-4388 or visit a satellite office in the colleges or the main CMC office in Webb Center North, suite 2202.

Career Management Center

The Career Management Center (CMC) offers a comprehensive array of career programs for students under the auspices of the Career Advantage Program (CAP). CAP is a series of career-related events and services designed to include a credit-bearing practical work experience related to a student's major. This practical experience may take the form of an internship, cooperative education experience, clinical rotation, student teaching, or a class containing a real-world, hands-on project.

CAP invites students to link with the Career Management Center and the available resources necessary for them to gain their career advantage early in their career planning process. Services are available from the time they first begin their studies at Old Dominion University. Recognizing that all students do not follow the same path, the program is designed to meet the needs of traditional, non-traditional, transfer, commuter, and distance students alike.

The Student Employment Program assists individuals in locating part-time and seasonal work on or off campus, including federal work-study positions for those who qualify. The Job Posting Unit advertises jobs of all types, including permanent full-time positions, electronically through eRecruiting. This powerful interactive web-based system, available free to students and alumni, is a database of student and employer information, career information, a career event calendar and interview schedules, and the means to electronically apply for positions posted. It is also the primary tool used by the CMC to communicate with students.

Individual career consultations and electronic assessment tools as well as seminars on career exploration are available to assist in major and career path selection. Each college has an experienced professional CMC staff assigned to offer career assistance to students at all levels. CMC maintains full service satellite offices in the Colleges of Arts and Letters, Business and Public Administration, Engineering and Technology, Health Sciences and Sciences, which house the CMC Liaison to that college and are co-located with academic advisors from the college and the Center for Major Exploration advisors, creating a "Triad" of advisors for the students within each college. A hybrid satellite office, providing assistance onsite live during published office hours and real time virtual assistance at other times via electronic communication technology, provides services to students at the Virginia Beach Higher Education Center.

Cooperative education and internship experiences are available at the junior, senior and graduate levels. These programs allow students to gain valuable experience related to their major, while testing out possible career choices. All students are encouraged to participate in one or more practical experiences.

Professional seminars in resume writing, job search strategies, interview skills, salary negotiation and other career-related topics are offered throughout the year and are also available in video streamed and on-line versions. These are complemented by classroom and group presentations and other special career events, including employer information sessions, the employer sponsored seminar series "Career Advice and a Slice," as well as employer and alumni career information panels and etiquette dinners.

General job fairs are held twice a year and are supplemented by specialized fairs for specific populations, including a teacher fair, a graduate recruitment fair, and a summer job fair. Graduating students can also take advantage of the On-campus Recruiting Program, which provides the opportunity to interview, on campus, with employers for entry-level positions.

Students seeking additional career guidance may select mentors through the Alumni Mentor Program, created in partnership with the Alumni Association. Potential mentors in every discipline and from all over the nation and the world are available to students via eRecruiting.

Many of the programs and services available on campus are also offered on-line and via video streaming through the CMC website, eRecruiting, and the Cyber Career Center. The CMC has developed this exciting opportunity as part of the any-time, any-place virtual career center model for students and alumni who prefer or require assistance from a career professional through electronic means. The Cyber Career Center allows CMC staff to provide quality career assistance from a distance, replicating face-to-face services through interactive media and multiple electronic means of communication. The National Association of Colleges and Employers (NACE) recognized

Student Health Services

Old Dominion University Student Health Services is accredited by the Accreditation Association for Ambulatory Health Care, Inc. The Health Center is located at 1007 South Webb Center, (757) 683-3132, Facsimile (757) 683-5930.

Student Health Services provides primary outpatient care and health education for Old Dominion University students. These services include medical care for acute illness and minor injury, routine health care, preventive health care and family planning. Student Health Services also provides referrals to health care providers in the local community for services beyond the scope of the campus health center. When necessary, bed care is available for brief daytime observation periods or until transfer to an acute facility can be arranged. Laboratory testing sent off campus and x-rays or other diagnostic tests are done at the student's or family's expense. Full-time Norfolk campus students should complete the immunization requirements before coming to school. Any immunizations administered at Student Health Services are done at the student's expense.

All entering full-time Norfolk campus students (undergraduate, graduate, transfer, and English Language Center students) are required to complete the Tuberculosis (TB) Risk Assessment on the health history form submitted to Student Health Services. Each student determined to be part of an at risk population for TB must present the results of a TB skin test (Mantoux PPD) to Student Health Services within two months prior to matriculation at Old Dominion University. Any student with symptoms of active TB will be required to be tested immediately. Students who are not in compliance with the University Policy 4002 for TB screening will be reported to the Dean of Students.

All entering full-time Norfolk campus students are required to have all their immunizations up to date, including the Meningitis and/or Hepatitis B vaccine waiver forms if the student declines these vaccines. A complete list of immunization requirements and health history/immunization forms are on the Student Health Services website at studentaffairs.odu.edu/student/healthservices.

Health education provides Old Dominion University students with information, education and programs to address their health concerns and needs. Health education focuses on the whole person and seeks to engage students in educational, experiential, and service learning opportunities to illustrate the importance of a healthy lifestyle. Health education is also responsible for campus-wide programs to prevent alcohol and substance abuse among students. Students may also volunteer as members of the Student Health Advisory Council (SHAC). Call (757) 683-5927 to speak with a health educator.

Student Health Insurance. All full-time and part-time students are encouraged to make provision for payment of charges for health services not provided by Student Health Services. The University recommends that all students carry adequate personal health insurance. International students are required to have health insurance. See the Student Health Services web site for information regarding health insurance at www.studentaffairs.odu.edu/healthservices.

Counseling Services

The primary purpose of Counseling Services is to assist students with the transitions and changes they encounter during their college years. The staff helps students to better understand themselves and their potentials and to enhance problem-solving skills. The staff also lend support and assistance during times of crisis.

Counseling Services offers personal assessment, short-term individual and small group counseling, crisis intervention, referral for psychiatric services or long-term counseling, and a variety of educational programs that promote personal, academic and career development. Consultation services are also available to student organizations, faculty and staff. For more information, see the website at www.studentaffairs.odu.edu/counseling, come to 1526, first floor North Mall of Webb Center or phone 683-4401.

Housing

Living on campus provides opportunities to build friendships and develop a sense of group belonging. The Office of Housing and Residence Life staff members strive to create a residential environment that encourages the exploration of new ideas, behaviors, responsibilities, and ways of interacting with other individuals while allowing students to remain fully engaged in their academic pursuits. Students are encouraged to explore independence and autonomy within the context of responsible citizenship and mutual respect.

Variety is the word that best describes ODU's housing options. From Whitehurst Hall with rooms overlooking the Elizabeth River, to apartment-style living in the exciting and new University Village, to more traditional residence halls and apartment complexes, students can experience university life to its fullest by residing on campus. It opens a world of interaction with other students, faculty and staff through many social, educational, cultural and recreational activities – everything from men's and women's basketball games at "The Ted" to provocative lecture series speakers to a dizzying array of PAW events (Programs All Weekend) in Webb Center.

As a member of the campus community, students can look forward to a special time of learning and maturing in welcoming and familiar surroundings. By choosing to live on campus, students are making Old Dominion not only their university, but also their home.

For further information about living on campus and the variety of options available, please visit the Office of Housing and Residence Life web site at: www.odu.edu/housing. For answers to specific questions, contact: The Office of Housing and Residence Life, 4601 Elkhorn Avenue, Suite 1208, Norfolk, Virginia 23508, call (757) 683-4283 or email: housing@odu.edu.

Off-Campus Housing. Student Services for Off-Campus Students is located in 1104 Webb Center and provides an off-campus housing information system free to all University students. Those desiring off-campus housing may use the system to locate apartments or other accommodations and to find roommates. The office serves as a clearinghouse for general information on off-campus life. The housing information system can also be accessed via the web at web.odu.edu/offcampushousing.

International Student and Scholar Services (ISSS)

The Old Dominion University community includes more than 900 international students and 100 visiting scholars from more than 100 foreign countries. Serving the cultural, legal and personal needs of these individuals is the main mission of the Office of International Student and Scholar Services. The office provides administrative support and documentation services along with information and regulatory advising to assist international students and scholars in obtaining the best educational experience possible. Among the specific offerings of the Office of International Student and Scholar Services is a complete range of immigration and related legal advising and individual assistance with the many cultural aspects of studying in a foreign country. ISSS administers the International Student Leadership Award Program, which provides tuition support for international students who demonstrate extraordinary leadership and academic involvement. Visit the ISSS website at www.odu.edu/iss.

Filipino American Center

In line with Old Dominion's vision of a multicultural university, the Filipino American Center responds dynamically and creatively to the academic, educational, cultural, and social concerns of Filipino Americans. It serves as a resource and research center for Philippine history and culture and the Filipino American experience. It is a center for social interaction where Filipino culture and values are promoted, revitalized and celebrated. The center serves as a cultural liaison to the University and the Hampton Roads communities. Its strategic location in the College of Arts and Letters allows for an integrated approach in crafting and encountering new avenues of culture with a distinctive academic orientation.

The Center incorporates into its programs a heightened awareness for the diverse heritage of the Filipino American. The goals of the center are to serve as a resource center for the University, the Filipino American and the Hampton Roads communities and conduct research on Filipino Americans, promote courses in Filipino American Studies and plan summer programs or semester abroad (Philippines), and foster close linkages with Filipino American alumni.

The Filipino American Center is located at 1411 W. 49th Street. For more information, visit the web page at www.al.odu.edu/filipino/.

The Office of Intercultural Relations

The Office of Intercultural Relations (OIR) is committed to creating a campus community that values and supports the cultural identities of each of its members. Through education and training, OIR creates opportunities that develop and enhance internal skills and competencies that foster an inclusive environment. The programs, activities, and events not only present unique and entertaining cultural experiences and celebrations, but also cultivate a climate of awareness, understanding, and respect of diverse individuals and groups.

OIR strives to fulfill its commitment to students of diverse backgrounds by undertaking the following responsibilities:

- Support competitive and equitable recruitment and international orientation programs.
- Sponsor and support programs/activities that enhance the educational experience and understanding of cross-cultural impact from a global perspective.
- Establish collaborative University partnerships to ensure policies and procedures reflect the commitment to diversity.
- Design and implement critical cross-cultural initiatives and programs that promote the celebration of diversity.
- Develop training and cultural modules that focus on the dynamics of social justice.

International Student Programming. OIR is committed to the academic, social and cultural support of Old Dominion University's large and diverse international student community. Arrival assistance for new students, orientation support, off-campus activities, and University-wide events are designed to sustain a vibrant international student community. Additionally, programs provide opportunities to enhance domestic students' awareness and understanding of the various cultural frameworks from a global perspective.

Diversity Institute. The Diversity Institute at Old Dominion University enhances awareness, commitment, knowledge, and skills that are needed to develop leaders as change agents in a culturally diverse world. Semester-long sessions include modules and cultural learning labs that train participants on how to operate in a diverse multicultural and global setting. In addition to developing communication skills needed in a pluralistic society, the Diversity Institute is an excellent resume-builder.

Graduate Student Organization (GSO)

The Graduate Student Organization is an officially recognized group formed especially for the needs of Old Dominion University's graduate student body. Foremost among its many goals is to form an overall meeting arena for the graduate student community to get to know each other outside of individual courses of study.

Another goal is to be an outlet for the graduate student voice, to act as a liaison group between the graduate body and the University, and to bring the University the concerns or issues that are specific to the study at the graduate level. Current projects include revamping graduate orientation and forming surveys about such issues as graduate health insurance, extended library hours and graduate housing opportunities, so that we may effectively bring them to the attention of the University.

For more information, see orgs.odu.edu/gso.

Recreational Sports

The Recreational Sports Department offers programming in the following areas: Intramurals, Sport Clubs, Fitness and Wellness Informal Recreation, and Outdoor Adventure Programming. The new Student Recreation Center, which opened in the Spring of 2009, provides the primary place to recreate for members of the ODU community. This state-of-the-art facility features nearly 15,000 square feet of fitness equipment, a rock climbing wall, a multi-activity center gym, racquetball courts, a cycling studio, an outdoor adventure rental center, and much more. In addition, the Fitness Center at University Village provides participants with another state-of-the-art workout facility. This facility was recently upgraded and has a small shower and locker space available. Other spaces that are available at specific times for member use include: tennis courts, outdoor fields and the Sailing Center. Participants must be able to validate their identity with a valid University ID card when attempting to enter or participate in programs and activities sponsored by the department. For daily updates of department facility hours or events, visit the webpage at <http://studentaffairs.odu.edu/recsports/> or contact the office at 683-3384.

Women's Center

Serving the Old Dominion University Campus since 1976, the Women's Center offers programs and services to address the special challenges and opportunities women students encounter related to their personal and academic success. Also, recognizing the critical role that both women and men play in creating a world that is free of gender bias, the Center's goals include promoting healthy relationships and a safe and equitable learning environment that is free of barriers to all persons. Center services seek to empower all students to achieve their personal, academic and professional potential. S.A.F.E., Sexual Assault Free Environment, provides crisis intervention, education, advocacy and ODU policy/procedure information related to issues of sexual assault, stalking, sexual harassment and relationship violence experienced by women and men. W.I.L.D., Women's Institute for Leadership Development, provides an opportunity for women students to identify and develop their leadership skills through seven modules. Additional programs are offered throughout the year that address a variety of topics related to women's academic and personal success including programs in celebration of Women's History Month in March. Referrals to University and community resources and a student resource room are also available. All students are encouraged to get involved with the Women's Center as a volunteer, intern or M-POWER Peer Educator.

Programs and services of the Center are open to women and men. For more information, please call 683-4109 or visit www.studentaffairs.odu.edu/wc/.

Dining Services

Monarch Dining Services is responsible for many operations across campus. Webb Center is home to a wide range of dining options including Café 1201, House of Blue & Café, and Monarch Catering. The House of Blue Café has five separate operations including Pangeos, Grille Works, Pizza Hut, Blue's Bakery, and Rustic Kitchen and a C3 Express store. Located in Webb Center are Quizno's and Chick-fil-A. Café 1201 is a residential restaurant dining option that allows students to use their meal plans in Webb Center and provides a value to faculty, staff, and commuter students. Starbucks shops are also available in Webb Center and the Village Bookstore. Hours and products available vary depending on the academic calendar.

Whitehurst and Rogers Residence Hall dining facilities are available to all cash, meal plan, flex points, and Monarch Plus card customers and provide a residential restaurant within the student housing facility.

Monarch Catering offers services from coffee set-ups to extensive dinner menus and everything in between.

For hours of operation please visit the website at www.odu.edu/monarchdining.

Motor Vehicle Parking

All motor vehicles parked in University parking facilities must display a valid parking permit. Students, faculty and staff are required to purchase permits; visitors and guests may obtain complimentary one-day parking permits upon request. Permits may be obtained at the parking facility located at 43rd Street and Elkhorn Avenue.

University motor vehicle regulations are enforced year around except as noted in the ODU Motor Vehicle Regulations Manual. Permit regulations are enforced from midnight Sunday until 4:00 p.m. Friday. Evening permits are available for purchase by students attending classes after 3:45 p.m.; evening permits are not valid for daytime parking.

Additional information and copies of the Old Dominion University Motor Vehicle Regulations may be obtained by calling Old Dominion University Parking and Transportation Services at (757) 683-4004 or visit the website at www.odu.edu/af/parking.

Old Dominion University Bookstore

The primary purpose of the Bookstore is to serve the students of the University by making available books and supplies required for course work. In addition, the store maintains wide selections of general books, college supplies, and art materials. For information and operating hours call 683-0048.

University ID Cards

All students who are officially registered for one or more credit hours at Old Dominion University are eligible to receive a free student picture ID card.

Student ID cards are issued at the University Card Center located in Room 1056 Webb Center. If the ID card is lost or stolen, there is a replacement fee. Spouses and dependents of students are not eligible to receive an ID card.

The University ID card is an official form of identification. The ID card lists the bearer's full name, University identification number (UIN) and status with the University. Each student can possess only one valid ODU ID card at one time. The ID card must be carried at all times when at Old Dominion University and presented upon request to University officials. Any misuse of the University ID card will result in disciplinary actions.

Not only is the University ID card an official form of identification, it also serves many other functions. Students can use their card to check out books from the library, participate in University events such as sports and socials, access residence hall and meal plans, and make purchases from their Monarch Plus account. For more information, visit the website at www.odu.edu/cardcenter, email cardcenter@odu.edu or call 757-683-3508.

Webb University Center

Webb University Center is the hub of the campus activities. It houses student activities, student organizations, student government, and a wide variety of student services, health services, bookstore, dining and catering, ODU Credit Union, a travel agency, and other services.

Campus Information Center

The Campus Information Center is a clearinghouse for information on University services, procedures, and activities. Designed to help students deal more effectively with the structure of a large university, the Center offers information about on- and off-campus life and provides referrals to the resources best able to meet student needs. The services of the center are available to the students, faculty, staff, and general public. The Center also provides information and assistance in a number of critical areas for off-campus students, including the following: transportation information, off-campus housing listings, and the Car Assistance Program. Students can also visit the off-campus housing web site at web.odu.edu/offcampushousing. The Campus Information Center, located in the lobby of Webb Center, can be reached by calling (757) 683-5914.

Disability Services

Disability Services is committed to creating access to higher education for students with disabilities. The University meets the requirements of Section 504 of the Rehabilitation Act of 1973 and the Americans With Disabilities Act of 1990 by providing accommodations and services, which are based upon documentation submitted by the student. Reasonable accommodations are made for students with learning, medical, psychological, visual, hearing, mobility, temporary, and other impairments on an individual basis. Accommodations and other supportive services available in Disability Services make a positive difference in the educational experience of students with disabilities and contribute significantly to their academic success.

In order to obtain assistance, all students must provide appropriate documentation and register with Disability Services. Guidelines for documentation and procedures for registration may be located at www.studentaffairs.odu.edu/disabilityservices. More specific information can be obtained by calling (757) 683-4655 or by e-mailing disabilityservices@odu.edu. Student interactions with Disability Services remain confidential. New students who need assistance are expected to contact Disability Services at least 45 days before registration to make arrangements. Currently enrolled students need to make arrangements for accommodations as soon as they have pre-registered for a semester.

Disability Services is located at 1525 Webb Center. The Section 504 Coordinator, who is also Director of Affirmative Action, Equal Opportunity, and Diversity, is located at 121-A Spong Hall and can be reached at (757) 683-3141.

Student Judicial Affairs

The Office of Student Judicial Affairs (OSJA) exists to promote the community standards of Old Dominion University. As such, OSJA helps to provide education to the University community about students' rights and responsibilities as members of the University community. The office also oversees the administration of the student conduct process when students are alleged to have violated University policies.

The rights and responsibilities of students are outlined in the *Student Disciplinary Policies and Procedures* (available in this Catalog and on the

Student Judicial Affairs web site at <http://studentaffairs.odu.edu/osja>). This document also provides an overview of the complete process that will be followed to resolve alleged violations of University policy. For more information please visit the website or call (757) 683-3431.

Student Ombudsperson Services (S.O.S.)

Student Ombudsperson Services (S.O.S.) has as its primary goal assisting students in difficulty along their journey to achieve their personal and academic goals. The S.O.S. office seeks to help students understand University policies and procedures, will gather information relative to their stated concerns, and help them engage in constructive problem solving.

The Student Ombudsperson can assist students with:

- Course Withdrawals
- Absence Notifications
- Conflict Resolution
- Emergency Loans
- Withdrawal from the University

Contact Information:

2008 Webb Center
757-683-3442

Website: <http://studentaffairs.odu.edu/sos>

E-mail: SAHearsU@odu.edu

Office of Student Activities and Leadership

Involvement in student activities has a great potential for contributing to students' overall development. By discovering and participating in cocurricular and extracurricular activities, students can develop their interpersonal and leadership skills and increase their career-related learning. The goal of the Office of Student Activities and Leadership is to personalize and broaden the educational experience of the University's students. Toward this goal, the office works with students, faculty, and staff to create an atmosphere conducive to social, multicultural, and recreational cocurricular activities. For more information, visit the website at www.studentaffairs.odu.edu/osal.

The office oversees the following:

1. Sponsoring programs and activities through the Student Activities Council (SAC). These programs include films, special events, concerts, Homecoming, and novelties.
2. Coordinating space allocations in Webb Center for meetings and events.
3. Supervising students in the organization of major concerts, programs and other fund-raising activities.
4. Supervising fraternity and sorority activities and events.
5. Directing the organization and implementation of special events such as Main Street (the campus organizational fair), Homecoming, the Student Affairs Leaders Award Ceremony, and Leadership Labs.
6. Coordinating the recognition and annual registration process for current student organizations and for new student groups, and coordination of student organizational budgets.
7. Providing continuing support for student organizations, including officer training, group development, and leadership education.
8. Encouraging ethnic, cultural, gender and other special interest groups to sponsor their own events in order to promote multiculturalism on campus.
9. Providing an outlet for volunteer services, allowing students, faculty and staff volunteers to link up with volunteer and community services throughout Hampton Roads.

Leadership Development Opportunities. To maximize and realize the potential of individual students and student organizations, the Office of Student Activities and Leadership assists in the planning and implementation of students' participation in leadership conferences, seminars, courses, and retreats throughout the academic year. These programs, available to any special interest group or student organization, focus on the identified purpose or needs of each group. Individual students interested in developing their leadership skills are also urged to participate.

Student Organizations. The University recognizes a wide variety of clubs that promote student interests in a broad range of fields. Student-run organizations are available in the following categories: educational, honors, professional/departmental interest, programming, recreational, religious, and student governing boards. A complete list of organizations can be found at www.studentaffairs.odu.edu/osal.

Fraternities and Sororities. There are 14 international/national fraternities and 11 international/national sororities at Old Dominion University. The purpose of these organizations includes the maintenance of high standards of fraternal life and inter-Greek relations and cooperation with the University in achieving high social standards and sound scholarship. Service to the University and the community, encouragement for leadership and brother/sisterhood are also at the forefront of Greek activity. The groups are coordinated through the National Pan-Hellenic Council (NPHC), Interfraternity Council (IFC), Panhellenic Council (PHC), and Multicultural Greek Council as well as through the Office of Student Activities and Leadership. Top Greek leaders and scholars are eligible for membership in the Order of Omega National Greek Honor Society.

Fraternities at the University

include:

Alpha Phi Alpha
Iota Phi Theta
Kappa Delta Rho
Lambda Chi Alpha
Lambda Upsilon Lambda
Omega Psi Phi
Phi Beta Sigma
Phi Kappa Tau
Pi Kappa Alpha
Sigma Nu
Sigma Phi Epsilon
Sigma Pi
Tau Kappa Epsilon
Theta Chi

Sororities at the University

include:

Alpha Phi
Alpha Kappa Alpha
Alpha Xi Delta
Delta Sigma Theta
Delta Zeta
Mu Sigma Upsilon
Pi Beta Phi
Sigma Gamma Rho
Sigma Lambda Upsilon
Zeta Phi Beta
Zeta Tau Alpha

Student Activities Council. The Student Activities Council (SAC) is an entirely student-run organization with the goal of providing quality events for Old Dominion University. Films, special events, concerts and Homecoming are SAC committees that are open to all students. Committee members help in planning and organizing events in their area.

Student Honor Council. Student members of the Honor Council generate interest in and awareness of the Old Dominion University Honor System. In addition, the Council provides representatives to serve on student conduct committee appeals hearings.

Mace and Crown Newspaper. Students at Old Dominion University publish a weekly newspaper, The Mace and Crown. In addition to keeping the campus informed, the University newspaper provides students the opportunity to develop skills in writing, photography, advertising, and management.

The National Honor Society of Phi Kappa Phi. The Old Dominion University Chapter of Phi Kappa Phi recognizes and honors superior scholarship in all academic disciplines. The Society hosts an initiation ceremony and provides scholarships for academic excellence. Membership in the Society is by invitation only, which requires both superior scholarship and good character as criteria.

Student Government Association. The Student Government Association is involved in many topical issues touching all areas of University life. Students may serve in University government as elected senators or as volunteers on Student Government Association committees. The Student Government Association is open to all students of Old Dominion University. Information about elective and volunteer positions is available from the Student Government Association Office, 1050 Webb Center, 683-3438.

WODU Radio Station. WODU, the student-operated campus radio station, serves two main purposes: providing experience for students interested in broadcasting, and entertaining and sharing relevant information with the student population. WODU helps students develop their skills in all areas of broadcasting, including management, marketing, engineering, and news and sports reporting..

College of Arts & Letters

www.al.odu.edu/

Chandra de Silva, Dean

Janet M. Katz, Associate Dean

Robert Wojtowicz, Associate Dean for Research and Graduate Studies

Ph.D. Criminology & Criminal Justice
 English
 International Studies

M.F.A. Creative Writing
 Visual Studies

Master's Applied Linguistics (M.A.)
 Applied Sociology (M.A.)
 English (M.A.)
 History (M.A.)
 Humanities (M.A.)
 International Studies (M.A.)
 Music Education (M.M.E.)
 Visual Studies (M.A.)

College of Arts and Letters

9000 Batten Arts & Letters Building
(757) 683-3925
(757) 683-5746

Mission

The special commitment of the College of Arts and Letters is to the ideals of the liberal arts. Its curriculum is designed to introduce students to the full range of human experiences through the study of cultural heritage, forms of artistic and literary expressions, patterns of social and political behavior, and methods of critical inquiry. The mission of the College of Arts and Letters is to prepare students for rigorous, intellectual and creative inquiry leading to their full development as human beings and to their responsible engagement with society. We accomplish this mission by: 1) Developing the essential skills of critical reading and thinking, effective oral and written communication, and proficient use of technology; 2) Providing foundational knowledge in the arts, humanities and social sciences for all undergraduates; 3) Offering excellent disciplinary and interdisciplinary programs of study and training that expose students to accumulated knowledge, scholarly debate, and innovations in the field; 4) Fostering global awareness and sensitivity to the breadth and diversity of the human condition, which includes acquiring an understanding of the roles of gender, race, ethnicity, and culture; 5) Providing an atmosphere for the free exchange of ideas among faculty and students and by vigorously defending academic and intellectual freedom; 6) Promoting challenging internship opportunities, research projects, and collaborative learning experiences that connect our students to the community and prepare them for the world of work; and 7) Supporting a broad array of cultural experiences that enrich the lives of students, the University, and the community.

Overview

Graduate programs in the College of Arts and Letters are structured to make possible close personal contact between students and faculty and thus to meet the needs of individual students. Arts and Letters faculty members are dedicated to good teaching, proud of their achievements in research, and committed to enhancing in every way possible the exciting and stimulating environment that is Old Dominion University. The College of Arts and Letters has graduate programs in Applied Linguistics, Applied Sociology, Criminology and Criminal Justice, English, History, Humanities, International Studies, Music Education, and Visual Studies. The programs in Applied Sociology and Visual Studies are offered jointly with Norfolk State University. The college offers M.A. degrees in Applied Linguistics, Applied Sociology, English, History, Humanities, International Studies, and Visual Studies; M.F.A. degrees in Creative Writing and Visual Studies; and Ph.D. degrees in Criminology and Criminal Justice, English, and International Studies.

Department of Art

203 Visual Arts Building
(757) 683-4047
Linda F. McGreevy, Chair

Graduate Programs in Visual Studies

There are two graduate programs in the Department of Art: Master of Arts in Visual Studies and Master of Fine Arts in Visual Studies. Each degree is offered jointly by Old Dominion University and Norfolk State University, providing concentrated individual programs that utilize the resources of both universities.

Admissions

Admission to the M.A. and M.F.A. programs is a separate process. Applicants must indicate the appropriate degree sought on the application form. Items required for submission are the same for both programs.

In addition to the general University admission requirements, the applicant must have completed a minimum of 36 semester hours in studio art and 12 semester hours in art history at the undergraduate level. The applicant must present a slide portfolio containing 15 to 20 examples of work. Recent work submitted on a CD or on videotape will be accepted if this is the most appropriate medium for evaluation. The portfolio must be accompanied by three letters of reference and a statement assessing the student's background and professional goals.

The Visual Studies programs have one admission period per year. All transcripts, recommendations, portfolios and other admission materials must be submitted by March 1 for students planning to enroll the following fall. Materials needed for review of financial aid requests must be submitted by February 15. Application for transfer credits in studio must be made at the time of admission. Students may apply for non-degree graduate status at any regular time of admission. Students may apply for non-degree graduate status at any regular admission period to enroll in designated courses. Inquiries concerning more detailed admission information should be directed to Graduate Program Director, Department of Art, Old Dominion University, Norfolk, Virginia 23529-0186. Applications are to be sent to the Office of Graduate Studies, Norfolk State University, 700 Park Ave, Norfolk, Virginia 23504.

Once admitted, students are considered fully enrolled on both campuses with full access to the combined resources of Old Dominion University and Norfolk State University.

Old Dominion University – Norfolk State University Registration Procedures

The registrar of Norfolk State University will register visual studies program students for either institution upon presentation of a properly signed joint program registration form. This arrangement will be honored both in regular sessions and in summer sessions and will apply to degree graduate students at the master's level at both institutions. Students must have completed the prerequisites for the courses for which they register. Tuition and fees applicable to the courses taken will be processed by Norfolk State University according to current inter-institutional policies under which these are regulated.

Master of Arts – Visual Studies

Kenneth Fitzgerald, Graduate Program Director

The M.A. in Visual Studies is a liberal arts degree that provides a broad academic foundation in the visual arts. It prepares students for advancement in art and art-related fields through full or part-time study.

Degree Requirements

The Master of Arts degree requires a minimum of 33 semester hours, including 18 hours in graduate studio, six hours in related academics, six hours in graduate seminars, and three hours in documentation (exhibition).

Curriculum

Graduate Studio	18 hrs
Related Academics	6 hrs
Graduate Seminars	6 hrs
Graduate Exhibition	3 hrs
Total	33 hrs

Students must earn at least a B (3.00) in all courses used to fulfill the graduate studio requirement. In consultation with the advisory committee, students must also take six hours of their graduate studio requirement on the alternate campus. M.A. students must also take ARTH 600 Graduate Seminar: Art Criticism (NSU: FIA 610). The Graduate Seminar is offered in alternate semesters at each campus.

Upon completion of 9 hours of graduate work, each student will present a selection of work to the faculty for discussion and evaluation. In the second semester, the student selects a major advisor and two advisory committee members, one from each campus. Midway through the second semester, a continuance and candidacy review will be conducted by the student's advisory committee and the graduate faculty. The committee will submit a written recommendation for continuance or termination to the student and program directors. The committee will include appropriate explanations of its decision. In the case of continuance, the committee will indicate candidacy for the M.A. degree.

All M.A. candidates must register for ARTS 702 Thesis Exhibition (NSU: FIA 702) during their final semester of study. Candidates are required to present a public exhibition of their work to meet this requirement. Each candidate's advisory committee will submit the documentation requirements in writing to the candidate and to the visual studies program co-directors.

The student's thesis committee, composed of the advisory committee and two additional graduate studio faculty members, one from each campus, will be responsible for evaluating all preparation and work done for ARTS 702 (NSU: FIA 702). The committee will submit its recommendations and grade assignments for each course to the student and the program co-directors.

Graduate Studio

Students must earn at least a B (3.00) in all courses used to fulfill the graduate studio requirement. A student receiving less than a B in any studio course may not use that course to fulfill the studio requirement. The course must be repeated or another course must be taken in its place. In consultation with the advisory committee, students must also take six hours of their graduate studio requirement on the alternate campus.

Related Academics

The selection and direction of these courses will be determined by the specific nature of each student's creative interests and professional goals and must be approved by the advisory committee or the graduate program directors. Graduate-level art history courses may be used to satisfy this requirement.

Graduate Seminars

In their first year of study, all students must take ARTH 600 Graduate Seminar: Art Criticism (NSU: FIA 610). The Graduate Seminar is offered in alternate semesters at each campus. The remainder of this requirement may be fulfilled by enrolling in ARTS or FIA 595 or 695: Special Topics. Note: Students must maintain a B average to qualify for a degree. All course work must be completed within a four-calendar-year period. At least three-fifths of the courses taken for the program must be 600-level or above.

Master of Fine Arts – Visual Studies

Kenneth Fitzgerald, Graduate Program Director

The M.F.A. in Visual Studies is a professional degree for students seeking an advanced level of proficiency and expertise that can develop only from extended study; as such it is considered to be the terminal degree in the fine arts.

Degree Requirements

The Master of Fine Arts degree requires a minimum of 60 semester hours, including 27 hours in graduate studio, 12 hours in related academics, nine hours in graduate seminars, six hours in directed field experience appropriate to the

student's professional goals, and six hours in documentation (including the solo exhibition).

Curriculum

Graduate Studio	27 hrs
Related Academics (includes any Art History courses)	12 hrs
Directed Field Experiences	6 hrs
Graduate Seminars	9 hrs
Documentation (including Solo Exhibition)	6 hrs
Total	60 hrs

Students must earn at least a B (3.00) in all courses used to fulfill the graduate studio requirement. In consultation with the advisory committee, students must also take nine hours of their graduate studio requirement on the alternate campus. In their first year of study, all students must take ARTH 600 Graduate Seminar: Art Criticism (NSU: FIA 610). The Graduate Seminar is offered in alternate semester at each campus.

Upon completion of 9 hours of graduate work, each student will present a selection of work to the faculty for discussion and evaluation. In the second semester, the student selects a major advisor and two advisor committee members, one from each campus. At the end of the first year of study, a continuance and candidacy review will be conducted by the student's advisory committee and the graduate faculty. The committee will submit a written recommendation for continuance or termination to the student and program co-directors. The committee will include appropriate explanations of its decision. In the case of continuance, the committee will indicate candidacy for the M.F.A. degree.

M.F.A. candidate must take ARTS 700 Directed Field Experience (NSU: FIA 700). Working closely with the advisory committee, the student will select one activity that could include a teaching internship on or off campus; independent study at another institution; an internship in a museum, community center or other art program; work in a design agency or other pertinent work environment; an apprenticeship with an established artist; or a special project off campus.

All M.F.A. candidates are required to enroll in ARTS 701 Documentation (NSU: FIA 701) during their final semester of study. By review of a candidate's work, the advisory committee will submit the documentation requirements in writing to the candidate and the visual studies program co-directors. All M.F.A. candidates must register for ARTS 702 Thesis Exhibition (NSU: FIA 702) during their final semester of study. Candidates are required to present a public exhibition of their work to meet this requirement. Each candidate's advisory committee will submit the documentation requirements in writing to the candidate and to the visual studies program co-directors.

The student's thesis committee, composed of the advisory committee and two additional graduate studio faculty members, one from each campus, will be responsible for evaluating all preparation and work done for ARTS 701-702 (NSU: FIA 701-702). The committee will submit its recommendations and grade assignments for each course to the student and the program co-directors.

Graduate Studio

Students must earn at least a B (3.00) in all courses used to fulfill the graduate studio requirement. A student receiving less than a B in any studio course may not use that course to fulfill the studio requirement. The course must be repeated or another course must be taken in its place. In consultation with the advisory committee, students must also take nine hours of their graduate studio requirement on the alternate campus.

Related Academics

The selection and direction of these courses will be determined by the specific nature of each student's creative interests and professional goals and must be approved by the advisory committee or the graduate program directors. Graduate-level art history courses may be used to satisfy this requirement.

Graduate Seminars

In their first year of study, all students must take ARTH 600 Graduate Seminar: Art Criticism (NSU: FIA 610). The Graduate Seminar is offered in alternate semesters at each campus. The remainder of this requirement may be fulfilled by enrolling in ARTS or FIA 595 or 695: Special Topics. Note: Students must maintain a B average to qualify for a degree. All course work must be completed within a six-calendar-year period. At least three-fifths of the courses taken for the program must be 600-level or above.

Department of English

5000 Batten Arts and Letters
757-683-3991

Jeffrey H. Richards, Chair

Graduate Programs in English

There are four graduate programs in the English department: Master of Arts in Applied Linguistics; Master of Arts in English; Master of Fine Arts in Creative Writing; and Ph.D. in English. Each program has its own guidelines and admissions policy.

Master of Arts - English

Joseph Cosco, Graduate Program Director

The Master of Arts program in English develops professional competency in literary and textual analysis and in writing. The program offers emphases or options in literature, the teaching of English, rhetoric and composition, and professional writing. The program prepares students for further graduate study in English; for professional writing and editing; for teaching in secondary schools and colleges; for further study in such fields as anthropology, law, psychology, and philosophy; for careers in government and industry; and for other professions requiring analytical, literary, linguistic, digital media, or writing skills.

Admission Information

The student must initially meet all general University admission requirements. Scores from the Graduate Record Examination general test are required. For regular admission, students must generally have at least 24 undergraduate hours in English, or a closely related field, with a grade point average of 3.0 or better. However, students applying to the professional writing concentration (see professional writing option) may have little or no undergraduate course work relating to English, provided that they have an average of 3.0 or better in their undergraduate major. Students applying to all concentrations must also, in addition to other admissions materials, provide a writing sample, preferably of previous professional or academic work, that demonstrates their preparation for graduate-level writing. All students in the English graduate program must demonstrate a high level of skill in written expression.

International students must submit scores from the TOEFL examination, a sample of scholarly writing, and three recommendations, at least one of which evaluates ability in English. For regular admission, students must score 230 on the computer-based TOEFL (the equivalent of 570 in the older, paper-based score scale or 80 on the TOEFL iBT). Students may be admitted provisionally with a TOEFL score of 213 (550 in the paper-based scale), but must attain the scores required for regular admission after 12 hours of graduate work.

Degree Requirements

The Master of Arts degree in English requires 30 credit hours and the passing of a comprehensive oral examination. No more than 12 credit hours on the 500 level may be counted toward a degree. An identifiable unifying principle is required for each student's program.

Master of Arts Thesis Option

The opportunity to undertake a long research project or other appropriate project is available to students in the Master of Arts in English. Writing a thesis may be of particular benefit to those who contemplate further graduate work or who have a strong desire to pursue a single topic in great depth. Under the guidance of an advisor (a member of the graduate faculty), the student may earn six hours of credit for a completed, approved thesis.

Master of Arts Oral Comprehensive Examination

During the first three weeks of the semester in which they intend to graduate, students must contact the graduate program director in English to schedule their comprehensive examination. The oral comprehensive examination covers each

student's particular program of study. Based on the courses taken by the student, the examination tests the student's mastery of materials and concepts, interpretive skills, and ability to make critical distinctions and connections. The examination of a thesis student will also cover the thesis and its related areas. Students who fail the oral comprehensive examination may retake the test only once in a different semester. Students who fail a second time will no longer be eligible to receive the Master of Arts in English from Old Dominion University.

Literature Option

Edward Jacobs, Coordinator

This option requires:

Three hours in British Literature before 1800

Three hours in British Literature after 1800, New Literature in English, or Postcolonial Literature and Theory

Three hours in American Literature before 1800

Three hours in American Literature after 1800

ENGL 600 Introduction to Research and Criticism

ENGL 764 Theories of Literature

ENGL 791 Graduate Seminar in English (when related to literature)

Nine hours of electives, at least six hours of which must be in literature

Professional Writing Option

Julia Romberger, Coordinator

Designed to prepare students to expand and theorize their practices of workplace writing and to prepare students for doctoral work in the field. This option requires:

ENGL 539 Writing in Electronic Environments 3

ENGL 685 Writing Research 3

ENGL 706 Visual Rhetoric and Document Design 3

ENGL 715 Professional Writing Theories and Practice 3

Three hours from:

ENGL 686 Introduction to Rhetoric and Writing Studies 3

ENGL 760 Classical Rhetoric and Theory Building 3

ENGL 765 Modern Rhetoric and Theory Building 3

Three hours from:

ENGL 540 General Linguistics 3

ENGL 550 American English 3

ENGL 577 Language, Gender and Power 3

ENGL 595 Topics (when Advanced Grammar) 3

Three hours from:

ENGL 664 Teaching College Composition 3

ENGL 665 Teaching Writing with Technology 3

ENGL 680 Second Language Writing Pedagogy 3

Three hours from:

ENGL 527 Writing in the Disciplines 3

ENGL 535 Management Writing 3

ENGL 573 Writing with Video 3

ENGL 581 Advanced Public Relations 3

ENGL 595 Topics (when relevant to Professional Writing) 3

ENGL 662 Cybercultures and Digital Writing 3

ENGL 664 Teaching College Composition 3

ENGL 668 Graduate Internship & Project in Professional Writing 3

ENGL 673 Discourse Analysis 3

ENGL 680 Second Language Writing Pedagogy 3

ENGL 686 Introduction to Rhetoric and Writing Studies 3

ENGL 695 Topics (when relevant to Professional Writing) 3

ENGL 701 Texts and Technologies 3

ENGL 716 Professional Writing in/for International Contexts 3

ENGL 760 Classical Rhetoric and Theory Building 3

ENGL 765 Modern Rhetoric and Theory Building 3

ENGL 766 New Media Theory and Production I 3

ENGL 771 New Media Theory and Production II 3

Electives:

Six hours of electives 6

Portfolio Option: As one of their oral exam options (the exam alone and thesis plus exam being the other two), students may choose to develop a portfolio as the capstone project for the MA in English professional writing option. Students choosing the portfolio will propose the scope of their individual projects to the graduate program director and the committee chair. Portfolios are a collection of individual texts with a meta-narrative that explains the connection between these texts and the portfolio's intellectual

underpinnings. The entire portfolio should range between 10,000 and 15,000 words. Portfolios can be, but are not limited to, a collection of extensively revised course work, a collection of teaching materials, or a collection of new media texts. Portfolios can be submitted in a notebook or electronically. To help prepare the portfolio, students will be encouraged to take an independent study for up to 3 credits as one of their electives; the student's committee chair should direct this independent study.

Rhetoric and Composition Option

Kevin DePew, Coordinator

Designed to prepare students to teach and administer writing in language arts, community college, or university contexts, and to prepare students for doctoral work in composition and/or rhetoric.

ENGL 539	Writing in Electronic Environments	3
ENGL 664	Teaching College Composition	3
ENGL 685	Writing Research	3

Three hours from:

ENGL 686	Introduction to Rhetoric and Writing Studies	3
ENGL 760	Classical Rhetoric and Theory Building	3
ENGL 765	Modern Rhetoric and Theory Building	3

Three hours from:

ENGL 540	General Linguistics	3
ENGL 550	American English	3
ENGL 577	Language, Gender and Power	3
ENGL 595	Topics (when Advanced Grammar)	3

Three hours from:

ENGL 721	Composition as Applied Rhetoric	3
ENGL 760	Classical Rhetoric and Theory Building	3
ENGL 765	Modern Rhetoric and Theory Building	3

Six hours from:

ENGL 527	Writing in the Disciplines	3
ENGL 586	Media Law and Ethics	3
ENGL 595	Topics (when related to Rhetoric and Composition)	3
ENGL 662	Cybercultures and Digital Writing	3
ENGL 665	Teaching Writing with Technology	3
ENGL 673	Discourse Analysis	3
ENGL 680	Second Language Writing Pedagogy	3
ENGL 687	Colloquium for Teachers of English	3
ENGL 695	Topics (when related to Rhetoric and Composition)	3
ENGL 701	Texts and Technologies	3
ENGL 706	Visual Rhetoric and Document Design	3
ENGL 720	Pedagogy and Instructional Design	3
ENGL 721	Composition as Applied Rhetoric	3
ENGL 760	Classical Rhetoric and Theory Building	3
ENGL 763	Seminar in Discourse Analysis	3
ENGL 765	Modern Rhetoric and Theory Building	3
ENGL 766	New Media Theory and Production I	3
ENGL 771	New Media Theory and Production II	3
ENGL 795	Topics (when related to Rhetoric and Composition)	3

Electives 6 hours of electives 6

Portfolio Option: As one of their oral exam options (the exam alone and thesis plus exam being the other two), students may choose to develop a portfolio as the capstone project for the MA in English rhetoric and composition option. Students choosing the portfolio will propose the scope of their individual projects to the graduate program director and the committee chair. Portfolios are a collection of individual texts with a meta-narrative that explains the connection between these texts and the portfolio's intellectual underpinnings. The entire portfolio should range between 10,000 and 15,000 words. Portfolios can be, but are not limited to, a collection of extensively revised course work, a collection of teaching materials, or a collection of new media texts. Portfolios can be submitted in a notebook or electronically. To help prepare the portfolio, students will be encouraged to take an independent study for up to 3 credits as one of their electives; the student's committee chair should direct this independent study.

Teaching of English Option

Timothy Bostic, Coordinator

This option requires:

Three hours in British Literature before 1800

Three hours in British Literature after 1800, New Literature in English, or Postcolonial Literature and Theory
 Three hours in American Literature
 Three hours of Research and Criticism, ENGL 600
 ENGL 555 Teaching of Composition OR 664 Teaching of College Composition
 ENGL 687 Colloquium for Teachers of English
 ENGL 760 Classical Rhetoric and Theory Building OR ENGL 765 Modern Rhetoric and Theory Building
 Three hours of Linguistics
 Six hours of electives

Graduate Certificate in New Literature in English

Easily completed in one calendar year, this certificate gives students who already hold at least a master's degree in a different field the 18 hours of graduate study in literature that are the minimum requirement for teaching that subject at the post-secondary level in Virginia. Requirements are:

1. Three hours in British Literature before 1800;
2. Three hours in British Literature after 1800, or Postcolonial Literature and Theory
3. Three hours in American Literature; and,
4. Nine hours of electives in literature (which may include ENGL 600 and 764)

NOTE: at least nine of the 18 hours must be at the 600-level.

Graduate Certificate in Professional Writing

Easily completed in one calendar year, this certificate is designed for professionals who want to supplement their undergraduate degrees and sharpen their writing and communication skills. To apply for the certificate contact the coordinator of Professional Writing.

Twelve hours from:

ENGL 527	Writing in the Disciplines	3
ENGL 535	Management Writing	3
ENGL 539	Writing in Electronic Environments	3
ENGL 573	Writing with Video	3
ENGL 581	Advanced Public Relations	3
ENGL 583	Advanced News Reporting	3
ENGL 584	Feature Story Writing	3
ENGL 585	Editorial and Persuasive Writing	3
ENGL 586	Media Law and Ethics	3
ENGL 664	Teaching College Composition	3
ENGL 665	Teaching Writing with Technology	3
ENGL 668	Graduate Internship and Project in Professional Writing	3
ENGL 685	Writing Research	3
ENGL 686	Introduction to Rhetorical Studies	3
ENGL 687	Colloquium for Teachers of English	3
ENGL 695	Topics (when topic related to professional writing)	3
ENGL 715	Professional Writing Theories and Practice	3
ENGL 716	Professional Writing in International Contexts	3
ENGL 760	Classical Rhetoric and Theory Building	3
ENGL 765	Modern Rhetoric and Theory Building	3
ENGL 766	New Media Theory and Practice I	3
ENGL 771	New Media Theory and Practice II	3

Graduate Certificate in the Teaching of Writing

Easily completed in one calendar year, this certificate gives students who already hold at least a master's degree in a different field the 18 hours of graduate study in the teaching of writing that are the minimum requirement for teaching that subject at the post-secondary level in Virginia. Requirements are:

ENGL 664 Teaching of College Composition;
 ENGL 687 Colloquium for Teachers of English;
 ENGL 760 Classical Rhetoric and Theory Building OR ENGL 765 Modern Rhetoric and Theory Building; and,
 Nine hours of English electives in Rhetoric, Professional Writing, Journalism, Linguistics, or Creative Writing.

NOTE: At least nine of the 18 hours must be at the 600-level.

Master of Arts - Applied Linguistics

Joanne Scheibman, Graduate Program Director.

The Master of Arts in Applied Linguistics prepares students to pursue advanced graduate study or to teach in colleges, adult education programs, businesses, private schools, or institutions in the U.S. or abroad. The program's two emphases are Teaching English to Speakers of Other Languages (TESOL) and Sociolinguistics. Students in the program may also earn the Commonwealth of Virginia Endorsement for English as a Second Language and/or a certificate in TESOL.

Admission Information

In addition to general University admission requirements, applicants must have taken at least 9 hours of upper-level English, linguistics, or foreign language courses. The Graduate Record Examination (GRE), General Test, is required of all applicants. International students must submit scores from the TOEFL CBT (computer-based), 230 for regular admission and 213 for provisional, TOEFL PBT (paper based) 570 for regular admission 550 for provisional, or 80 on the TOEFL iBT, a sample of scholarly writing, and three recommendations, one of which evaluates proficiency in English. (For non-native speakers of English, there are also alternative ways of demonstrating English proficiency such as the University Bridge Program.) After 12 hours of graduate work, international students must meet the TOEFL requirement for regular admission.

Degree Requirements

The M.A. in applied linguistics requires 33 credit hours and the passing of an oral comprehensive examination. No more than 12 hours may be taken on the 500 level.

Curriculum - TESOL Emphasis

The following six courses are required:

ENGL 540	General Linguistics	3
ENGL 670	Methods & Materials in TESOL	3
ENGL 671	Phonology	3
ENGL 672	Syntax	3
ENGL 675	Practicum (Student Teaching)	3
ENGL 679	First and Second Language Acquisition	3

Three courses must be chosen from the following:

ENGL 544	History of the English Language	3
ENGL 550	American English	3
ENGL 577	Language, Gender, and Power	3
ENGL 674	Graduate Internship	3
ENGL 676	Semantics	3
ENGL 677	Language and Communication Across Cultures	3
ENGL 678	Sociolinguistics	3
ENGL 695	Topics in English (Linguistics)	3
ENGL 705	Discourse and Rhetoric Across Cultures	3
ENGL 770	Research Methods in Applied Linguistics	3
ENGL 773	Seminar in Discourse Analysis	3
ENGL 778	Seminar in Sociolinguistics	3

Students must have six hours of electives or a thesis approved by the graduate program director. In some cases, a 700-level course may be substituted for the corresponding 600-level course.

Sociolinguistics Emphasis

The following six courses are required:

ENGL 540	General Linguistics	3
ENGL 550	American English	3
ENGL 671	Phonology	3
ENGL 672	Syntax	3
ENGL 673	Discourse Analysis	3
ENGL 678	Sociolinguistics	3

Three courses must be chosen from the following:

ENGL 544	History of the English Language	3
ENGL 577	Language, Gender, and Power	3
ENGL 670	Methods & Materials in TESOL	3
ENGL 674	Graduate Internship	3
ENGL 676	Semantics	3
ENGL 677	Language and Communication Across Cultures	3
ENGL 679	First and Second Language Acquisition	3

ENGL 695	Topics in English (Linguistics)	3
ENGL 705	Discourse and Rhetoric Across Cultures	3
ENGL 770	Research Methods in Applied Linguistics	3
ENGL 773	Seminar in Discourse Analysis	3
ENGL 778	Seminar in Sociolinguistics	3

Students must have six hours of electives or a thesis approved by the graduate program director. In some cases, a 700-level course may be substituted for the corresponding 600-level course.

Master of Arts - Applied Linguistics Thesis Option

Writing a thesis may benefit those who contemplate further graduate work, as well as those who have a desire to pursue a single topic in depth. Under the guidance of a member of the graduate faculty, a student may earn six hours of credit for a completed approved thesis. Students who write a thesis will defend the thesis early in their final semester and complete their oral exam in a separate examination.

Master of Arts - Applied Linguistics Oral Comprehensive Examination

At the end of the program, all students must complete an oral comprehensive examination that covers each student's program of study and, where applicable, the thesis. Students who fail the oral comprehensive examination may take the test one more time in a different semester. Students who fail a second time will no longer be eligible to receive the Master of Arts degree in applied linguistics from Old Dominion University. One week before the oral examination, students must submit a portfolio that will include all course syllabi, major assigned papers and a reflection about the entire M.A. experience.

Graduate Certificate in Teaching English to Speakers of other Languages (TESOL)

This certificate may be of interest to students who want to teach English abroad or in the private sector. It includes five courses (some of which have ENGL 540 as a prerequisite): ENGL 670, 671, 672, 675, and 677. The certificate may be taken independently of the degree, but students must be admitted to the graduate program. A maximum of 6 semester hours of graduate credit may be transferred into the TESOL certificate program.

Master of Fine Arts - Creative Writing

Luisa Igloria, Graduate Program Director

The Master of Fine Arts in creative writing is widely regarded as a terminal degree. It is designed to prepare students for careers as publishing writers in fiction, poetry, or prose nonfiction. A secondary goal is to emphasize not only preparation for college-level teaching (the practical vocational goal of most M.F.A. programs in creative writing), but also includes, preparation of graduates for careers as free-lance writers in prose (magazines, newspapers, and features) and for work as speech writers, translators, editors and publishers.

Admission

Applicants must have completed a bachelor's degree from an accredited institution with at least a 3.0 G.P.A., including a minimum of 24 credit hours in English with at least a B average. The Graduate Record Examination (GRE), General Test, is required of all applicants. Candidates must also submit writing samples in each genre for which they wish to be considered; final admission will depend on faculty evaluation of those writing samples. Students who have not completed 24 undergraduate credit hours in English may be admitted provisionally and make up the required undergraduate courses.

Requirements

Students in the M.F.A. program must complete 54 total credit hours (39 hours of required courses and 15 hours of approved electives). In addition, students must also maintain a 3.00 GPA overall, satisfy a mid-program review, and complete all work within six years. Students choose courses based upon

their genre of study, and should consult the graduate program director or their advisor when selecting a schedule.

Required Courses: 39 hours

ENGL 650	Creative Writing Workshops (offered in Nonfiction Fiction, or Poetry; may be repeated up to 6 times with 3 different topics)	12
ENGL 660	Craft of Narrative OR	
ENGL 661	Craft of Poetry (depending on the student's genre)	3
Literature (4 courses)	Choose from*: ENGL 503, 507, 516, 521, 523, 533, 537, 538, 546, 547, 548, 559, 560, 561, 562, 565, 566, 592, 593, 595, 615, 632, 641, 645, 647, 655, 656, 657, 658, 659, 695, 791, 792	12
(Note: No more than 12 hours of courses at the 500 level may be counted toward the degree)		
ENGL 694	Thesis Colloquium (should be taken in the last semester of the second year or the first semester of the third year)	3
ENGL 698, 699	Thesis	3-9
Electives	Additional Creative Writing Workshops, Writers-in-Community Internship credits, additional American, British, or World Literature Courses, or courses in other fields (approved in advance by GPD)	15

Master of Fine Arts in Creative Writing Thesis

All candidates for the M.F.A. in creative writing must complete a thesis project of publishable quality in their chosen genre (poetry, fiction, prose nonfiction). Each student will select an adviser from the graduate faculty and work with that advisor and a committee of readers to prepare the manuscript. At the completion of the thesis, students will schedule an oral defense with the advisor and the committee, at which point the thesis will be adjudged as to its readiness for final acceptance, printing, and binding.

Master of Science in Education - English

Refer to the Darden College of Education section of this catalog.

Doctor of Philosophy - English

Joyce Neff, Graduate Program Director

The Ph.D. in English integrates writing, rhetoric, discourse, technology, and textual studies. Offering opportunities for creative reinterpretation of these fields within the discipline of English, the program emphasizes research that examines texts in a variety of overlapping and sometimes competing language-based worlds. The focus is on how the creation and reception of texts and media are affected by form, purpose, technology of composition, audience, cultural location, and communities of discourse. Students may pursue full- or part-time study through a combination of on-campus and distance learning courses. Students focus their studies in one of two doctoral fields: 1) Rhetoric and Textual Studies, and 2) Professional Writing and New Media Studies.

The Rhetoric and Textual Studies track has been designed for those interested in applying the analytic tools provided by rhetoric, linguistics, and critical/literary theory to the study of verbal, graphic, and visual texts. Emphasis is placed on how texts are composed, constructed, produced, as well as how they function within and promote the formation of (inter)personal, social, cultural, and political sites. The program prepares students for placement and advancement in academic and nonacademic careers related to the study and teaching of rhetorical theories/practices, composition instruction and administration, as well as rhetorical approaches to composition, discourse, literature and culture.

The Professional Writing and New Media track is designed for those in education and industry who wish to study the connections between discourse and technology. Emphasis is placed on analyzing professional writing and new media from historical, theoretical, pedagogical, practical, and research perspectives. Courses examine advanced document design, usability studies, and digital literacy issues. Through theoretical exploration and experiential learning, the program prepares graduates for leadership roles in technical and professional communication, composition instruction and administration, and software development.

Distance Learning Students

Selected courses are offered online or in hybrid learning environments to accommodate students wishing to pursue doctoral study. One to two distance learning courses per semester are offered, but distance students have the opportunity to take six to nine additional hours through the Doctoral Summer Institute program (see description under "Time Limits and Residency" below). Distance learning students need high speed internet access (e.g. cable modems or DSL), a web cam, and specialized video conferencing software. For an updated list of technical requirements, please contact the graduate program director.

Applications

Applications for fall semester admission must be submitted no later than February 15. Applicants residing in other countries should mail materials well in advance of that date. All required forms and documents should be sent directly to the Graduate Admissions Office. Application packets are available online at the Office of Graduate Admissions website. The following should be submitted along with the appropriate application forms: 1) a 1500-word statement of the applicant's academic and professional goals and a discussion of how the Ph.D. in English will contribute to the achievement of those goals; 2) three letters of reference from sources capable of commenting on the applicant's readiness for advanced graduate study in English; 3) a writing sample of at least 20 double-spaced pages on a topic related to the applicant's expertise; 4) GRE general exam (taken within the last five years).

Admission Standards

A completed master's degree (or its equivalent) in English or in an appropriate field (such as rhetoric, composition, English education, communication, or computer science) from a regionally accredited institution of higher education is required. Admission to the professional writing and new media studies track may be granted to especially strong candidates whose graduate work is not primarily in English—though some additional coursework may be required.

1. A minimum grade point average (GPA) of 3.5 (on a 4.0 scale) overall for the master's degree.
2. Recent scores on the verbal and writing sections of the GRE General exam.
3. If the applicant's native language is not English, a current score for the Test of English as a Foreign Language (TOEFL) of at least 600 and/or an interview in which the applicant's comprehension and fluency in English can be assessed.

Course Work. The Ph.D. requires 39 hours of course work, with at least nine additional hours devoted to the dissertation.

Curriculum

Core Classes (15 credit hours). Students begin their studies with a cluster of core courses that focus on texts, technology, research methods, instructional design, cross-cultural communication, and major debates in the profession.

ENGL 801	Texts and Technologies	3
ENGL 805	Discourse and Rhetoric Across Cultures	3
ENGL 810	Major Debates in English Studies: Writing, Language, Literature	3
ENGL 820	Pedagogy and Instructional Design	3
ENGL 840	Empirical Research Methods and Project Design	3

Fields of Specialization (12 credit hours). Students complete a field of concentration that allows for intensive specialization in one of the two tracks described above. A list of courses approved for each track is available from the graduate program director.

Electives (9 credit hours). Students are encouraged to use their electives to enhance their interdisciplinary knowledge of a field concentration and to enhance their understanding of theoretical modeling, quantitative/qualitative research methods, or history and culture.

Dissertation Seminar (3 credit hours). Taken in the semester before the student's candidacy examination, this course supports students in preparing their dissertation proposals and generating an annotated bibliography. It sets up writing groups for cohorts of students entering the dissertation stage of their graduate studies.

Dissertation Credits (minimum of 9 credit hours). A dissertation is required of all Ph.D. students. A dissertation prospectus will be submitted after the student's successful completion of the candidacy exam. If the student's proposed dissertation committee approves the prospectus, the student will proceed to research and write the dissertation. An oral defense of the

dissertation will be scheduled after a draft of the completed dissertation is approved by the student's dissertation committee.

Research Competency Requirement. Because the PhD is a research degree, all students are expected to present evidence of mastery of a basic research competency over and above the usual English or related-field course work. This is most readily achieved through demonstration of expertise in a foreign language. However, the program also offers other options: new media application and statistics. To enter candidacy for the doctoral degree, students must present evidence of mastery of a foreign language equivalent to second-year undergraduate facility. This can be done by transcript, by demonstration of native language proficiency (for those who speak English as a second language), taking coursework at Old Dominion or elsewhere equivalent to second-year language facility (at Old Dominion University, through language courses numbered 202), passing a standardized test at the appropriate level, or passing an examination administered by the Department of Foreign Languages geared to second-year language mastery. A grade of B or above in both semesters of the foreign language requirement should be presented to the GPD as soon as possible in the student's career and certainly before enrolling in the Dissertation Seminar. For the new media application or statistics alternative to the competency requirement, see the English department website.

Candidacy Exams. After students have completed all course requirements and language requirements, they must pass a written examination related to their chosen field. Exams are designed in consultation with an examination committee approved by the graduate program director of English, and they are directed toward the critical or scholarly project the student plans to pursue in the dissertation. Students who fail the written exam will not be allowed to submit their dissertation proposal or to begin work on their dissertation. The written exam may be retaken only once and no earlier than the semester following the student's initial attempt.

Grade Requirements. All Ph.D. students will be graded on the traditional A, B, C, F scale (with pluses and minuses) in all courses. Pass/Fail evaluations will be utilized only in the case of registration for internships or for thesis or dissertation research, or when specifically approved by the director. Graduate students whose grade point averages fall below 3.00 (B) will be placed on a probationary status. After two consecutive semesters below this average or the accumulation of two grades of "C" or below, the graduate program director and the Ph.D. advisory committee may dismiss the student from the doctoral program.

Time Limit and Residency Requirements. The doctoral program must be completed within eight years of entry into Ph.D. course work. Residency requirements can be fulfilled by two semesters of full-time study on campus or by attending two Summer Doctoral Institutes.

Transfer Credit. Twelve graduate hours not used to fulfill the requirements of a degree at other institutions or at Old Dominion University may be applied toward the fulfillment of degree requirements. Transfer credit is accepted as degree credit at the discretion of the graduate program director.

Financial Aid. Full-time students are eligible to apply for university fellowships and teaching and research assistantships, which are awarded on a competitive basis.

Nondegree Students. Nondegree students must obtain the approval of the graduate program director before registering in graduate English courses.

Additional Information. Additional information is available on the English Department website.

Department of History

8000 Batten Arts and Letters Building
757-683-3949

Annette Finley-Croswhite, Chair

Master of Arts - History

Ingo Heidbrink, Graduate Program Director

The Department of History offers courses of study leading to the Master of Arts with a major in history.

Admissions

Applicants must meet all University requirements and regulations for admission. Their applications must include a short essay of 500 words or less,

addressing their academic interests and goals, and two letters of recommendation. The Graduate Record Examination (GRE), General Test, is required for all applicants.

An undergraduate major or minor in history is desirable but is not required for admission. Generally, 18 semester credit hours in history and closely related cognates are sufficient for admission on a provisional basis. These credit hours should include survey and upper level courses. The graduate program director may prescribe certain undergraduate courses to be completed before recommending admission to the program. Under certain circumstances, students can be admitted to graduate courses while simultaneously completing an undergraduate prerequisite.

The requirement for admission to full standing (regular status) is 24 semester credit hours with an average of at least 3.00 in history and a general GPA of 3.00. Provisional admission requires 18 credits (as described above) with an average of 3.00 in history and a GPA of 2.70. Students with averages below these minimums can attempt to improve their standing in undergraduate courses approved by the graduate program director. However, they cannot be admitted to graduate courses until they have achieved acceptable averages in history. Applicants who are denied admission to the M.A. program in history are not permitted to enroll in history graduate courses as non-degree students.

Prospective applicants with questions about their admission status should contact the graduate program director in the Department of History. Those certain of their qualifications should apply through the Office of Admissions.

Admissions forms should reach Old Dominion University well in advance of the intended term of entry, but no later than November 1 for spring admission, March 1 for summer, and June 1 for fall. All required forms and documents should be sent directly to the Admissions Office, which creates a central file for each applicant. Only the one-page application for graduate financial assistance along with a duplicate copy of the 500-word essay should be sent directly to the graduate program director.

Graduate Financial Aid

Old Dominion University offers financial assistance to qualified graduate students. Types of aid include research and teaching assistantships, fellowships, grants, scholarships, and part-time employment. Nearly all forms of aid require that the student be engaged in full-time graduate study.

Fellowships, assistantships, tuition grants, and small research grants may be available. Departmental funds may affect fellowship and assistantship amounts. The establishment of student need and academic promise also affect some grant amounts. The application deadline is February 15. Graduate teaching and research assistants are charged tuition at the in-state rate. International students must pass the SPEAK test (or an equivalent) of spoken English to become eligible for teaching assistantships.

Degree Requirements

Two courses of study are available. One is a 30-credit program capped by written comprehensive examinations in two general fields and an oral examination. The other is a 30-credit program, comprising 24 hours of course work, a thesis for which students earn six credits (HIST 698-699) on a pass/fail basis, and an oral examination. Either alternative leads to an M.A. in history.

All candidates for the M.A. in history must meet the general graduate degree requirements established for the University. In addition, all students must complete HIST 600 during their first year in the program. No more than nine of the required 30 hours may be earned in 500-level courses. Students are permitted a maximum of six credits in other departments offering graduate courses if the work is germane to their historical studies; prior approval of the graduate program director is required. Students who have received two grades of C+ or below, or whose grade point average falls below 3.00, will be indefinitely suspended from the program.

Curriculum

Examination Option

Students pursuing the exam option must take course work as follows:

- 6 credits in the Americas
- 6 credits in Europe, including Russia
- 3 credits in Africa or Asia
- 9 credits of electives
- HIST 600, Historical Theory and Practice, 3 credits
- HIST 675, Exam Preparation, 3 credits

Students choose two fields of concentration for the Examination Option, which will conform to the expertise of two of the three committee members who constitute the student's exam committee. The fields can be tailored to the following geographic areas: North America, Europe, Russia, Latin America, Asia, or Africa.

Students pursuing the examination option must complete HIST 675 during their last year in the program. Written comprehensive field examinations may be taken in conjunction with HIST 675. The two field exams are taken during a designated time over the course of two weeks with a two-hour oral examination following the completion of written exams. Exams are individualized by the student's examining committee but competence in the entire field is essential. Examinations are completed no later than 30 days before the end of a semester, and thus are normally scheduled in March, July, and November. A field exam is judged in its entirety and is rated Pass or Fail by the examining committee; the same is true of the oral examination. Students who fail an exam can be re-examined in the next scheduled round of exams. Only one re-examination is permitted.

Thesis Option

Students pursuing the thesis option must take course work as follows:

- 6 credits in the Americas
- 6 credits in Europe, including Russia
- 3 credits in Africa or Asia
- 6 credits electives
- HIST 600 Historical Theory and Practice, 3 credits
- HIST 698/699 Thesis, 6 credits

The thesis option will be recommended for those students who have maintained a high GPA and have the support of a faculty director. A review of the thesis prospectus is required before the completion of 18 hours of course work. The master's thesis is written under the direction of a thesis advisor selected by the candidate in consultation with the graduate program director. The thesis is reviewed and the candidate examined by a faculty committee chaired by the thesis advisor. The thesis defense—normally a two-hour oral examination—focuses on the thesis, the historical context, and related aspects of the student's concentration. Final approval of the thesis is the responsibility of the thesis advisor, the graduate program director, and ultimately of the dean of the College of Arts and Letters, who certify the candidate for graduation.

Institute of Humanities

432 Batten Arts and Letters
757-683-3821

Master of Arts - Humanities

Dana Heller, Graduate Program Director

The Institute of Humanities administers the Master of Arts program in the humanities offered by the College of Arts and Letters. The program, which emphasizes interdisciplinary studies, cultural studies, and critical studies, allows students to pursue individualized programs of study that incorporate work from more than one humanities discipline. Students may enroll in approved graduate courses from the following fields: art history, Asian studies, linguistics, literature, foreign languages, history, music, philosophy, political science and geography, sociology and anthropology, communication and film studies, women's/gender studies, international studies, etc.

Admission

The program is open to all qualified holders of the B.A. or B.S. degree and is designed for full-time students as well as part-time students, students who have recently completed their bachelor's degree as well as nontraditional students who are returning to an academic environment after an absence of some years, and students who are planning to pursue the Ph.D. as well as students who wish to broaden and strengthen their understanding of the humanities through advanced work at the master's level.

In addition to meeting general University requirements, an applicant must have an undergraduate average of 3.00 in the liberal arts and 2.80 overall, as well as 24 hours in liberal arts disciplines. All students seeking admission to the humanities program are required to submit recent GRE scores. Although admission is selective, the University recognizes that each individual possesses unique qualifications that will be taken into consideration. An essay of 500 words must be submitted with the application material. The essay should 1) propose a general program of study; 2) discuss personal, intellectual, and professional goals; and 3) explain the relationship of those goals to the intended program of study. All application inquiries should be made to the Office of Admissions.

Requirements

Students may pursue the 36-hour non-thesis option or the 33-hour thesis option. All students must take HUM 601 and 602. These courses provide an introduction to humanities research, methodology, and critical approaches, and serve as the foundation for each student's individualized program. In selecting their courses, students may take only 12 hours at the 500 level. All students must complete their graduate work within a six-year period.

Curriculum

All students must take the following two required courses, which provide an introduction to humanities research, methodology, and critical approaches, and serve as the foundation for each student's individualized program:

- HUM 601: The Subject of the Humanities: Intro. to Research, Methodology, and Theory 3 credits
- HUM 602: The Humanities on Trial: Postmodernity, Technology, Globalization 3 credits

Non-thesis Option

Students selecting the non-thesis option must take the capstone seminar, HUM 694. This seminar brings students together in their final semester of study in order to explore the current state of humanities disciplines and theories of interdisciplinary. All students are required to complete a final integrating paper that demonstrates effective interdisciplinary work. Students wishing to undertake special projects other than the research paper must obtain the approval of the graduate program director and appropriate faculty advisors.

Thesis Option

Students pursuing the 33-hour thesis option must take HUM 698-699 (thesis, six hours) in place of HUM 694. The thesis is to be based on original scholarly research and must reflect the interdisciplinary nature of the humanities degree. In rare cases, students may be permitted to undertake a creative project—the making of a film or video, the production of a musical or multimedia event—with the approval of the director. Each thesis student will be assigned a faculty advisor who will chair a thesis committee appointed by the director of the Institute of Humanities. The committee, consisting of faculty certified for graduate instruction in the College of Arts and Letters, will direct and evaluate the student's work. The thesis committee must have faculty members from at least two different Arts and Letters disciplines. Upon completion of the thesis, the committee will conduct a two-hour examination and defense of the thesis and the topics related to the student's program of study. A formal written statement explaining and justifying the project must be submitted before the oral examination.

Sample Study Program Options

The Master of Arts degree in humanities is an interdisciplinary graduate program. Choosing from more than 70 graduate-level courses offered through various departments of the College of Arts and Letters each semester, students may select their own emphasis and design a program in order to meet their own intellectual and professional objectives, or they may select a pre-approved concentration with a more structured program of study. Among the many emphases which may be developed are the following: Medieval Studies; Ideologies: Cromwell to Marx; African American Studies; Global Perspectives; American Studies; Ethics, Politics, and Cultural Values; Women's Studies/Gender Studies; Post-colonial Studies; Revolution and Modernity; Contemporary Art Criticism; Drama/Performance Studies; History and Theory of Film; and Religion and Public Policy.

Culture, Technology, and Social Change Concentration

This concentration was created to enhance humanities students' professional credentials and to enrich their academic experience by providing a structured program of graduate study that reflects a growing field of interdisciplinary scholarship. This concentration will foster critical thinking about the impact of technology on culture, society, and values. Moreover, it will prepare students for a job market that places increasing value on the ability to comprehend connections between technical and humanistic forms of knowledge.

Women's Studies Certificate

A Women's Studies Certificate is available to graduate students through the Institute of Humanities (in association with the women's studies program) upon completion of the following 15-hour program of course work:

WMST 560, 570.

At least nine additional credits in 500 or 600-level courses approved for the women's studies curriculum and drawn from various disciplines (such as English, history, political science and geography, foreign languages, art history, women's studies, etc.). No more than six of these credits may be taken in any one field.

At least one of the courses chosen must be on the 600 level.

Only students who hold a B.A. or B.S. degree with an overall GPA of 2.75 may apply for the graduate women's studies certificate. Students must maintain a 3.00 grade point average in the 15 graduate credits needed for the certificate. The women's studies certificate may be undertaken independently or in combination with a graduate degree in humanities (or in combination with another graduate degree). Students wishing to pursue the certificate through the Institute of Humanities must gain admission to the humanities graduate program before the completion of nine graduate hours and must satisfy all of the admission requirements for the program including the GRE.

The director of the women's studies program or a designee will serve as advisor for students who gain admission to the humanities program only for the purpose of pursuing the graduate women's studies certificate. Students pursuing the certificate in combination with a graduate degree in the humanities will have their progress monitored by both a women's studies advisor and the director of the Institute of Humanities.

For additional information please contact the Institute of Humanities at: <http://al.odu.edu/hum/>

International Studies

620 Batten Arts and Letters
757-683-5700

Regina Karp, Graduate Program Director

Old Dominion University offers M.A. and Ph.D. degrees in international studies through the Graduate Program in International Studies (GPIS).

GPIS is an interdisciplinary unit, offering advanced research and graduate training in global problems and transnational issues. Fields of concentration include: U.S. foreign policy and international relations, conflict and cooperation, international political economy and development, interdependence and transnationalism, and comparative and regional studies.

Master of Arts—International Studies

Admission Requirements

All candidates for admission into the M.A. must submit:

1. Graduate Record Examination (GRE) scores;
2. Official transcripts of all undergraduate or prior graduate course work submitted directly by all universities attended;
3. Two letters of recommendation addressing the candidate's capacity to undertake graduate work in international/global issues;
4. An essay of not more than 500 words describing interest in and capacity for advanced training in global/transnational issues; and
5. One example of writing or research (a paper submitted to a seminar, a publication or report, or another comparable example).

Any prior graduate course work taken at Old Dominion University (e.g., in nondegree status) or at another institution can be counted toward the M.A. degree only in accordance with the provisions governing transfer of credit and the director's approval.

Admission Standards

1. All applicants to the M.A. program must hold a baccalaureate degree or equivalent.
2. Candidates for the M.A. must attain a 3.00 cumulative GPA in all undergraduate courses. A GRE score of 1100 (combined verbal and quantitative) is normally expected.
3. Individuals whose native language is not English must submit a score of 230 on the computer-based TOEFL (the equivalent of 570 in the older, paper-based score scale) or 80 on the TOEFL iBT.

Application Deadline, M.A.

Applications for fall semester admission to the M.A. program and for financial assistance must be submitted to the Office of Graduate Admissions no later than February 15. Applications for spring semester admission to the M.A. program (only) are accepted on a limited basis and must be submitted to the Office of Graduate Admissions by October 15.

Degree Requirements

Credits for the M.A.

The M.A. requires 33 credits, of which at least 27 must be at the 600 level or above. The required course work for all M.A. students includes the basic methodology course (IS 600), but does not include any courses needed for demonstrating foreign language competency. M.A. candidates writing theses will incorporate into their 33-credit program six credits of directed research on the thesis. Students pursuing a non-thesis track will take a four and 1/2 hour comprehensive examination after the completion of their course work.

Curriculum

All M.A. and Ph.D. students must take IS 600, Research Methods; IS 655, International History and World Order; ECON 650, International Economics; and IS 601, International Relations Theory. Ph.D. candidates must also take IS 620, Advanced Methods. Each required course must be completed with a grade of B (3.00) or above. M.A. students must fulfill the requirements of nine credit hours in one field of concentration.

Required Courses, M.A. in International Studies

IS 600	Research Methods in International Studies	3
IS 655	International History and World Order	3
ECON 650	International Economics	3
IS 601	Seminar in International Relations Theory	3

Field of concentration	9
Electives, if thesis option 6 of these credits will be directed research	
IS 698 or 699	12
Total	33

Note: Up to six credits of elective coursework may be taken at the 500 level.

Fields, Area/Region, Methodology, Language and Foreign Experience Requirements. Fields of concentration include U.S. foreign policy, conflict and cooperation, international political economy and development, interdependence and transnationalism, and comparative and regional studies.

Methodology Requirements. The M.A. requires one methodology course (IS 600). M.A. students are encouraged to take further methods courses as electives.

Language Requirements. M.A. students must demonstrate reading competence in one foreign language other than English. International students who have English as a second language fulfill this requirement.

Foreign language competence can be demonstrated in one of two ways:

1. Students may complete a third year of language instruction at Old Dominion University (students may choose to enter the third year through a University placement test) or other institutions. A grade of B- or above in both semesters of third-year instruction will demonstrate competency in that language.
2. Students may take a language test. Exams are administered (for a fee) by the Department of Foreign Languages and Literatures. GPIS requirements concern reading comprehension competence. For more information about which skills will be tested and what standards of competency are required, contact GPIS. If a student wishes to demonstrate competency in an uncommonly taught language, GPIS will endeavor, so far as practicable, to arrange an examination by Old Dominion University faculty and/or consultants. For more information about this method for demonstrating language competency, contact GPIS.

Comprehensive Examinations. In consultation with their advisors, M.A. students will select either a thesis or non-thesis option. Students selecting the non-thesis track must pass a written comprehensive examination. Thesis students must pass an oral defense of their thesis.

The M.A. comprehensive examination may not be scheduled before students have completed all core and methodology requirements, nor may the M.A. comprehensive examination be scheduled prior to the last semester in which regular course work is taken. M.A. examinations are scheduled twice a year. If M.A. students fail the written comprehensive on the first attempt, they may retake the entire written comprehensive exam only once, no earlier than one semester later.

Theses. M.A. students choosing the thesis option will submit a thesis prospectus to the chair of their thesis committee for approval after the completion of 18 credits or at the beginning of the third semester in the program. The thesis should be submitted to the thesis committee for its approval at least two weeks before a defense is scheduled. The committee will schedule the student's oral defense of the thesis when the thesis appears to meet GPIS standards for master's theses. The oral defense will concern questions of substance and methodology.

Grade Requirements. All M.A. students will be graded on the traditional A, B, C, F scale (with pluses and minuses) in all courses. Pass/Fail evaluations will be utilized only in the case of registration for internships or for thesis or dissertation research, or when specifically approved by the director.

Graduate students for whom grade point averages fall below 3.00 (B) will be placed on a probationary status. After two consecutive semesters below this average or the accumulation of two grades of "C" or below, the director will take under consideration, in consultation with faculty, termination of the student's program.

Time Limit and Residency Requirements. The master's degree can be completed in four full-time semesters, although many M.A. candidates continue the degree over a longer period on a part-time basis. The M.A. must be completed within a six-year period.

Doctor of Philosophy-International Studies

Admission Requirements

All candidates for admission into the Ph.D. must submit:

1. Graduate Record Examination (GRE) scores;
2. Official transcripts of all undergraduate or prior graduate course work submitted directly by all universities attended;
3. Three letters of recommendation (at least two of which should be from prior professors) addressing the candidate's capacity to undertake graduate work in international/global issues;

4. An essay of not more than 500 words describing interest in and capacity for advanced training in global/transnational issues; and,
5. One example of writing or research (a paper submitted to a seminar, a publication or report, or other comparable example).

Any prior graduate course work taken at Old Dominion University (e.g., in nondegree status) or at another institution can be counted toward the Ph.D. degree only in accordance with the provisions governing transfer of credit and the director's approval.

Admission Standards

1. Applicants to the Ph.D. program must hold a master's degree in a related field of study.
2. Ph.D. candidates are generally expected to attain a GRE score of 1200 (combined verbal and quantitative) and have at least a 3.00 cumulative GPA in undergraduate and graduate courses, with a somewhat higher GPA for courses related to international, global or transnational issues.
3. Individuals whose native language is not English must submit a score of 230 on the computer-based TOEFL (the equivalent of 570 in the older, paper-based score scale) or 80 on the TOEFL iBT.
4. The Admissions Committee strongly recommends prior international experience (residence, study or work) and foreign language training for all Ph.D. applicants. Evidence of substantial international and foreign language background is highly desirable for applicants.

Application Deadline, Ph.D.

Applications for fall semester admission to the Ph.D. program and for financial assistance must be submitted to the Office of Graduate Admissions no later than January 15.

Degree Requirements

Credits for the Ph.D. The Ph.D. requires 78 credits, which must include at least 48 hours at the post-master's level (i.e., courses at the 700 or 800 level). These 48 hours include a minimum of 12 and a maximum of 18 dissertation credits. The 78 credits do not include any courses needed for demonstrating foreign language competency. Each student's program of study is supervised by a faculty committee.

Upon completion of coursework, Ph.D. students must pass a written and an oral comprehensive examination, submit a dissertation prospectus, write a dissertation, and undergo an oral defense of the dissertation.

Required Courses. All Ph.D. students must take IS 600, Research Methods; IS 606, American Foreign Policy and World Order; ECON 650, International Economics; and IS 601, International Relations Theory. Ph.D. candidates must also take IS 620, Advanced Methods. Each required course must be completed with a grade of B (3.00) or above. Ph.D. students must take 15 credit hours in one field of concentration and nine credit hours from another field, totaling 24 credit hours.

Curriculum

Required Courses, Ph.D. in International Studies

IS 600	Research methods in international studies	3
IS 655	International History	3
ECON 650	International economics	3
IS 601	Seminar in international relations theory	3
IS 620	Advanced statistical techniques for international studies	3
	Primary field of concentration	15
	Secondary field of concentration	9

Electives, 12-18 dissertation preparation credits

IS 898 or 899		39
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Total 78

Fields, Area/Region, Methodology, Language and Foreign Experience Requirements. Fields of concentration include U.S. foreign policy, conflict and cooperation, international political economy and development, interdependence and transnationalism, and comparative and regional studies.

Methodology Requirements. All Ph.D. students must complete a sequence of two basic methods courses beginning with IS 600. Students holding an M.A. from another institution who are entering the Ph.D. program may present transcripts showing a B (3.00) or above, plus syllabi and other documentation, from a similar introductory methods course to be exempted from IS 600.

Language Requirements. Ph.D. students must demonstrate reading competence in one foreign language other than English. International students who have English as a second language fulfill this requirement.

Foreign language competence can be demonstrated in one of two ways:

Department of Music

244 Diehn Fine and Performing Arts Center
757-683-4061

John Toomey, Chair

Master of Music Education, M.M.E.

Nancy K. Klein, Graduate Program Director

The College of Arts and Letters offers the Master of Music Education degree with concentrations in applied performance/conducting, research, or seminar option. The graduate degree is designed to stress the development of advanced knowledge of broad-based principles and practices in music and music education for application in the public or private school, private studio, or higher education setting. A minimum of 34-37 semester hours of course work is required to complete the degree, with the hours distributed according to the area of concentration. The degree does not provide Virginia state licensure for teaching.

Admission

In order to be admitted into the graduate program each candidate must have earned a bachelor's degree in applied music, music education, music history or music theory and have earned an overall GPA of 3.0 with a 3.0 in the major field of study. All candidates are required to take the GRE or the MAT. Candidates seeking the concentration in applied studies are required to audition before the graduate faculty. Video and audio-taped auditions are accepted.

Degree Requirements

The three areas of concentration for the Master of Music Education degree are: (1) Applied Studies, requiring 34 hours of course work and full master's recital in performance or conducting, (2) Research, requiring 34 hours of course work and a thesis or problems paper, (3) Seminar Option, requiring 37 semester hours of course work.

Before the completion of 12 credits, each candidate must declare an option of study. Those accepted into the applied option must pass an applied jury or performance presented before the graduate faculty for continuance review during each semester of study. Students in all areas of concentration must pass a written comprehensive examination near the completion of their studies.

The following courses are required for each concentration option:

ECI 600	Intro to Graduate Research	1
MUSC 603	Principles of Music Education	3
MUSC 604	Foundations of Music Education	3
MUSC 630	Research in Music Education	3

Additional course requirements are specific to the concentration option:

APPLIED STUDIES CONCENTRATION

Additional required courses:

MUSA 651	Applied Studies	3
MUSA 652	Applied Studies	3

Choose one of the following literature courses:

MUSC 605	Literature of the Band	3
MUSC 606	Choral Music Literature	3
MUSC 609	Orchestral Literature	3

Choose one history class from the following:

MUSC 560	History and Aesthetics of Jazz	3
MUSC 566	Modern Music	3
MUSC 590	Music in the Renaissance Era	3
MUSC 591	Music in the Baroque Era	3
MUSC 592	Music in the Classical Era	3
MUSC 594	Music in the Romantic Era	3

RESEARCH CONCENTRATION

Additional required courses:

MUSC 698	Thesis Research	3
MUSC 699	Thesis	3

SEMINAR OPTION

Additional required courses:

Choose one of the following history courses:

MUSC 560	History and the Aesthetic of Jazz	3
MUSC 566	Modern Music	3
MUSC 590	Music in the Renaissance Era	3

1. Students may complete a third year of language instruction at Old Dominion University (students may choose to enter the third year through a University placement test) or other institutions. A grade of B- or above in both semesters of third-year instruction will demonstrate competency in that language.
2. Students may take a language test. Exams are administered (for a fee) by the Department of Foreign Languages and Literatures. GPIS requirements concern reading comprehension competence. For more information about which skills will be tested and what standards of competency are required, contact GPIS. If a student wishes to demonstrate competency in an uncommonly taught language, GPIS will endeavor, so far as practicable, to arrange an examination by Old Dominion University faculty and/or consultants. For more information about this method for demonstrating language competency, contact GPIS.

Comprehensive Examinations. All Ph.D. students must pass a written comprehensive examination. Students who pass the written comprehensive examination must then pass an oral comprehensive examination.

The Ph.D. comprehensive examination may not be scheduled before students have completed all core and methodology requirements, nor may the Ph.D. comprehensive examination be scheduled prior to the last semester in which regular course work is taken. Ph.D. students are also required to fulfill the foreign language requirement before taking the comprehensive examination. Ph.D. examinations are scheduled twice a year. Ph.D. students failing the written comprehensive on the first attempt may retake the written comprehensive exam only once, no earlier than the following semester.

Dissertations. A dissertation is required of all Ph.D. students. A dissertation prospectus will be prepared after the successful completion of the comprehensive examination. If the student's graduate committee approves the prospectus, the student will proceed to research and write the dissertation. An oral defense of the dissertation will be scheduled after a draft is approved by the committee.

Grade Requirements. All Ph.D. students will be graded on the traditional A, B, C, F scale (with pluses and minuses) in all courses. Pass/Fail evaluations will be utilized only in the case of registration for internships or for thesis or dissertation research, or when specifically approved by the director.

Graduate students for whom grade point averages fall below 3.00 (B) will be placed on a probationary status. After two consecutive semesters below this average or the accumulation of two grades of "C" or below, the director will take under consideration, in consultation with faculty, termination of the student's program.

Time Limit and Residency Requirements. The doctoral program must be completed within eight years of entry into Ph.D. course work.

Graduate Certificates. Students seeking to combine international studies and women's studies may complete the 15-credit program leading to the certificate in Women's Studies, which is offered in cooperation with the Institute of Humanities and the Women's Studies Program. Students should contact the director of women's studies at (757) 683-3823 for information.

Transfer Credit. Twelve graduate credits earned at other institutions or at Old Dominion University may be applied toward the fulfillment of degree requirements. Transfer credit, including nondegree credit earned at Old Dominion, is accepted as degree credit at the discretion of the director.

Financial Aid. Full-time students are eligible to apply for University fellowships, teaching and research assistantships, and tuition grants which are awarded on a competitive basis.

Nondegree Students. Nondegree students must obtain the approval of the director before enrolling in graduate international studies classes.

Additional Information. Please see the GPIS Handbook and website at al.odu.edu/gpis. For other issues concerning GPIS, please contact the Graduate Program in International Studies (GPIS), 621 Batten Arts and Letters Building, Old Dominion University, Norfolk, VA 23529-0086, USA. Telephone: 757-683-5700. Fax: 757-683-5701. E-mail: isgpd@odu.edu.

MUSC 591	Music in the Baroque Era	3
MUSC 592	Music in the Classical Era	3
MUSC 594	Music in the Romantic Era	3
Choose one of the following literature courses:		
MUSC 605	Literature of the Band	3
MUSC 606	Choral Literature	3
MUSC 609	Orchestral Literature	3

The remainder of the course work for each option will be chosen from course offerings in the Department of Music.

Department of Sociology and Criminal Justice

6000 Batten Arts and Letters Building
757-683-3791

Randy Gainey, Chair

Master of Arts - Applied Sociology

Dianne Carmody, Graduate Program Director

The Master of Arts degree in applied sociology is offered jointly by the Department of Sociology, Norfolk State University, and the Department of Sociology and Criminal Justice, Old Dominion University. The M.A. degree may serve as professional training for students seeking employment in federal, state and local government agencies or in private-sector organizations. In addition, the M.A. program provides excellent training in the fundamentals of sociology for students who wish to pursue a Ph.D. in the social sciences.

The program provides students with training in theory and methods, as well as opportunities to participate in three areas of specialization: general sociology, criminal justice, and women's studies.

Admission

Students must hold a bachelor's degree with at least a 3.00 average on a 4.00 scale and must have completed at least 12 hours of undergraduate work in sociology or criminal justice, including courses in theory, research methods, and statistics. The Graduate Record Examination is required for all applicants.

Those who fail to meet one or more of the above requirements may be admitted as provisional students by the graduate program committee, which is composed of faculty members from Old Dominion University and faculty members from Norfolk State University.

Old Dominion University is the institution of formal record for this program.

Requirements

All students must complete 30 hours of course work including five required core courses (15 credit hours): SOC 610, 620, 630, 640, and 650. Each student must complete a thesis (six credit hours), which will be supervised by a faculty committee including members from both institutions.

Sociology Track

In addition to the requirements listed above, students choosing the sociology track must complete 15 credit hours of electives chosen from graduate sociology courses offered by the Department of Sociology and Criminal Justice, Old Dominion University, and the Department of Sociology, Norfolk State University. Selection of elective courses will be based upon individual advising.

Criminal Justice Track

In addition to the requirements listed above, students choosing the criminal justice track must complete CRJS 625 and 12 credit hours of electives chosen from graduate criminal justice courses offered by the Department of Sociology and Criminal Justice, Old Dominion University, and the Department of Sociology, Norfolk State University. Selection of elective courses will be based upon individual advising. Students will be awarded a certificate in criminal justice upon completion of the Master of Arts degree.

Women's Studies Track

In addition to the requirements listed above, students choosing the women's studies track must complete WMST 560 and 570 and nine credit hours of electives chosen from selected graduate women's studies courses and/or courses cross-listed with women's studies. No more than six hours of these credits can be taken in any one discipline (sociology and criminal justice are considered two separate disciplines). Selection of elective courses will be based upon individual advising. Students will be awarded a certificate in women's studies upon completion of the Master of Arts degree.

Curriculum

Required Core Courses:

SOC 610	Applied Social Research Methods	3
SOC 620	Proseminar in Sociological Theory	3
SOC 630	Applied Social Statistics (Prerequisite: SOC 610)	3
SOC 640	Sociological Application of Computer and Data Analysis (Prerequisite: SOC 610)	3
SOC 650	Research Seminar (Prerequisites: SOC 610, SOC 620, SOC 630, SOC 640)	3

Criminal Justice Track:

CRJS 625	Admin. Of Criminal Justice	3
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Women's Studies Track:

WMST 560	Feminist Thought	3
WMST 570	Women's Way of Knowing, Ways of Knowing Women	3

Electives Courses:

A variety of graduate elective courses in sociology and criminal justice are offered every semester. All courses are 3 credit hours. Recent elective courses include the following:

- Social Inequalities;
- Globalization, Justice and Human Rights;
- Violence Against Women;
- Criminological Theory and Public Policy;
- Cultural Adaptations;
- Drugs and Society;
- Diversity and the Criminal Justice System;
- American Jury;
- Community Justice;
- Crime in the Workplace;
- Life Course Perspective on Crime and Deviance; and
- Criminal Justice and the Law

Doctor of Philosophy – Criminology & Criminal Justice

Mona Danner, Graduate Program Director
<http://al.odu.edu/sociology/phdprogram>

The Ph.D. in Criminology & Criminal Justice produces students with strong backgrounds in criminology and criminal justice, research methods and statistics. It is designed primarily for students who are interested in pursuing careers in higher education, though our course offerings also provide students the education and skills needed to be employed as researchers and supervisors in various public and private agencies. Graduates from the program will be prepared as scholars, able to conduct research, teach college and university courses in their areas of specialization, and to provide service to the discipline. The program is offered on the main campus of Old Dominion University.

Regular Admission Requirements

1. A completed master's degree (or its equivalent) in criminology, criminal justice or in an appropriate field (e.g., administration of justice, sociology, or political science) from a regionally accredited institution of higher education – a thesis is generally expected;
2. A minimum grade point average (GPA) of 3.25 (on a 4.0 scale) overall for the master's degree;
3. A combined minimum score of 1,000 on the GRE general knowledge tests (verbal and quantitative) is generally expected;
4. Successful completion of prior coursework in research methodology and statistics at least equivalent to that required by the ODU B.A. in sociology / criminal justice and M.A. degree in applied sociology (research methods, statistics, computer and data analysis);

5. Three letters of reference from sources capable of commenting on the applicant's readiness for advanced graduate study in criminology & criminal justice;
6. A writing sample of at least 20 double-spaced pages on a topic related to the applicant's expertise or area of interest;
7. A typed statement of approximately 1,000 words summarizing the individual's motivation for applying to the program as well as the professional contributions s/he intends to make assuming successful completion of the degree;
8. If the applicant's native language is not English, a current score for the Test of English as a Foreign Language (TOFEL) of at least 560 and/or an interview in which the applicant's comprehension and fluency in English can be assessed.

Provisional Admission

Provisional admission may be granted when an applicant's credentials suggest aptitude for doctoral study but do not meet the criteria outlined above. Admission under this standard requires a variable amount of preliminary coursework in addition to that which is normally required for the degree. The amount and content of additional coursework required with provisional admissions is determined by the Ph.D. program director with conjunction with the graduate program committee on a case-by-case basis.

International Students

Graduate international students on non-immigrant visas whose native language is not English or who have not lived in the U.S. ten years must provide evidence of English language proficiency through one of the following:

1. Submission of a TOEFL score of 540 or successful completion of Old Dominion University's Graduate Bridge Program,
2. Possession of an American Bachelor's or Master's degree equivalent from an accredited institution located in a country where English is the native language,
3. GRE verbal score of 480.

Deadlines

February 15 – Students applying for funding (Graduate Assistantship) and Fall admission; there is no Spring admission. All students must submit all original application materials directly to Old Dominion University's Graduate Admissions Office. Students requesting funding (Graduate Assistantship) must submit the Application for Graduate Financial Assistance to the Program Director.

Degree Requirements

The Ph.D. in Criminology and Criminal Justice requires a minimum of 48 credit hours at the post-master's level (i.e., courses at the 700 to 800 level) as detailed below.

Core Courses (12 credit hours)

- CRIM 800 – Proseminar in Criminology & Criminal Justice
- CRIM 801 – Criminology & Public Policy
- CRIM 802 – Advanced Criminological Theory
- CRIM 803 – Inequality, Crime and Justice

Research Skills (12 credit hours)

- CRIM 805 – Multivariate Statistics and Data Analysis
- CRIM 810 – Qualitative Research Methods
- CRIM 815 – Advanced Multivariate Data Analysis
- CRIM 820 – Advanced Research Methods

Electives (12 credit hours)

Students complete 12 hours of electives selected from 700- or 800-level courses within the Department or across the University. The selection of electives will be guided by input from the program director depending upon course availability, program resources and student goals.

Dissertation Seminar (3 credit hours)

- CRIM 898 – Dissertation Seminar

Dissertation Credits (Minimum of 9 credit hours)

- CRIM 899 – Dissertation Credit
- CRIM 999 – Continued active status enrollment

Qualifying and Comprehensive Examinations

The qualifying exam evaluates a student's comprehension and ability to integrate and apply knowledge from first year courses and to demonstrate critical thinking skills in a written format. "First year coursework" refers to the six required core and research skills courses offered during every cohort's first

year. Written qualifying exams will be taken at the end of the first year of coursework in August by students enrolled full-time. Part-time students may choose to take qualifying exams at the end of the first year coursework, or may elect to take them upon completion of all first year coursework, but they must take them prior to the beginning of their third academic year in the program. Students may pass or fail the exam in whole or in part and need to retake only those parts that are failed. Students who fail any portion of the exam may register for fall classes but must retake the failed part(s) during Fall Break of that same year. Students who do not successfully pass the qualifying exam following the Fall Break retake will be dismissed from the program; these students may complete fall classes for credit if they wish.

The comprehensive exam assesses a student's mastery of the literature in criminology and criminal justice in theory, research methods and statistics, inequality and policy as applied to questions of criminological interest; and his/her ability to think broadly and critically and to present her/himself as a sophisticated intellectual thinker. Comprehensive exams are normally taken following completion of all coursework except the dissertation seminar; students may petition the PhD Committee to take the exam prior to the completion of all coursework. Students may pass or fail the exam in whole or in part and need to retake only those parts that are failed; they must retake the failed part(s) in accordance with the directions stipulated by comprehensive exam committee. Students who do not successfully pass the comprehensive exam following the retake will be dismissed from the program; they may complete the classes they are enrolled in that semester for credit if they wish.

Admission to Candidacy

A student is admitted to candidacy for the degree once the following criteria are satisfied:

- S/he has completed all Ph.D. coursework (excepting dissertation hours) with a GPA of at least 3.25;
- S/he has successfully passed the qualifying and comprehensive examinations;
- S/he has successfully defended a dissertation prospectus.

The Dissertation

The dissertation is a scholarly work investigating a problem of significance and should constitute a meaningful contribution to the body of existing knowledge regarding matters of criminology and criminal justice policy or practice. It is the culmination of a program of advanced study leading to a doctoral degree and, as such, is expected to demonstrate a high level of scholarly competence. It must show that the candidate is capable of conceptualizing and conducting sophisticated original research, analysis and reporting on an approved topic related to crime and justice by use of accepted scientific methods. Complete information about the dissertation is found on the program website.

Department of Women's Studies

3041 Batten Arts and Letters Building
(757) 683-3823

Jennifer Fish, Chair and Chief Departmental Advisor

Women's studies is a multi- and interdisciplinary field of study encompassing all aspects, historical and contemporary, of women's natures, lives, and perspectives. Old Dominion University offers a graduate certificate in women's studies, which may increase a student's career opportunities in governmental and non-governmental agencies, law, criminal justice, public relations, journalism, communications, counseling, the health professions, business, social welfare, the military, and many other fields; it can also prepare students for new and exciting research opportunities in graduate and doctoral programs.

Graduate students desiring to obtain a certificate in women's studies have several options:

A 15-credit-hour graduate women's studies certificate is offered through the Institute of Humanities. Students who are pursuing a graduate degree in humanities may do almost all their work in the field of women's studies or they may combine women's studies with emphases in other liberal arts disciplines.

Students who want only the graduate certificate without a graduate degree may attain it, but must apply, nonetheless, for graduate standing in the Institute of Humanities.

Students wishing to pursue the certificate through the Institute of Humanities must gain admission to the humanities graduate program before the completion of nine graduate hours and must satisfy all of the admission requirements for the program, including the GRE. Only students who hold a B.A. or B.S. degree with an overall GPA of 2.80 may apply for the graduate women's studies certificate.

The chair of the Women's Studies Department or a designate will serve as advisor for students who gain admission to the humanities program only for the purpose of pursuing the graduate women's studies certificate. Students pursuing the certificate in combination with a graduate degree in the humanities will have their progress monitored by both a women's studies advisor and the director of the Institute of Humanities.

Graduate students may also earn a women's studies certificate in addition to a graduate degree in another department or college. Students who have already earned or are pursuing graduate degrees in other fields may enhance their qualifications with a women's studies certificate. Those admitted to a graduate program and obtaining a master's degree in fields such as English, history, psychology, international studies, applied sociology, or counseling have the option of obtaining that degree with the women's studies certificate. For more information consult the chair of women's studies and see the relevant sections of the Catalog.

Students must maintain a 3.00 GPA in the 15 graduate credits needed for the women's studies certificate. The certificate is awarded upon the completion of the following program of course work.

Certificate Requirements

WMST 560 and 570

At least nine additional credits in 500- or 600-level courses approved for the women's studies curriculum and drawn from various disciplines (such as women's studies, English, history, political science and geography, foreign languages, sociology, criminal justice, etc.) No more than six of these credits may be taken in any one field, except women's studies. At least one of the courses chosen must be at the 600 level.

Students seeking an M.A. who wish to teach women's studies at a post-secondary level in Virginia should take 18 rather than 15 graduate credits in approved women's studies courses in order to meet accreditation requirements.

Centers and Institutes

Center for Family Violence Education and Research

The Old Dominion University Center for Family Violence Education and Research (CFAVER) is an interdisciplinary group of professionals with a common interest in empowering communities with education and information concerning family violence. The center's aim is to educate and promote an understanding of the various forms of family violence, including child abuse, sibling abuse, partner abuse, and elder abuse. Strategies to increase awareness about these problems include conducting interdisciplinary research focusing on different types of family violence, developing public awareness campaigns to educate members of the public about family violence, evaluating programs and processes used with family violence victims and offenders, and building relationships with various agencies responsible for family violence case care.

Institute for Applied Ethics

The Institute for Applied Ethics seeks to raise awareness and stimulate discussion of the ethical dimension of matters of public concern within the campus community and the larger Hampton Roads community; to strengthen moral community and foster a commitment to ethical ideals in public life; to facilitate reflection on the ethical standards that govern the professions; and to highlight the unique and valuable contribution that philosophical reasoning can make to practical decision making.

Institute for the Study of Race and Ethnicity

In support of the mission of Old Dominion University to place special emphasis upon understanding the perspectives of women, minorities, and non-Western cultures, the Institute for the Study of Race and Ethnicity (ISRE) seeks to develop, promote and implement academic, research and public service programs that focus on the study of race and ethnicity in the region, the nation, and globally. The political, social, economic, and cultural experiences of African Americans, Filipino Americans and other communities of color are emphasized in the work of the institute. ISRE seeks to establish itself as a major archive and research center in Virginia and the southeastern region of the United States by providing archival resources through its Resource Center and engaging in the collection, analysis, and dissemination of data and research.

Institute of Asian Studies

Old Dominion University seeks to promote an expanded awareness and understanding of the nations and cultures of Asia, to support and encourage research on Asia, and to make resources available to foster better understanding and more effective interaction between organizations and individuals in the Hampton Roads area and those in Asia. To achieve these goals, the Institute of Asian Studies coordinates special programs and administers a major and minor in Asian studies. It also facilitates cooperative relationships with higher education institutions and other organizations within the United States and throughout Asia. The institute director works closely with the Office of International Programs regarding scholarships and study abroad programs and opportunities.

The Institute for Jewish Studies and Interfaith Understanding

In 2002, with a \$300,000 matching grant from the Dudley Cooper Trust, Old Dominion University announced the establishment of an Institute for Jewish Studies and Interfaith Understanding dedicated to the idea that interfaith understanding involves both an appreciation of Judaism's historic role in the development of western civilization and an understanding of the cross-cultural development of the world's religions. To this end, the institute coordinates lectures, symposia and reading groups related to Jewish history and thought as well as Judaism's continuing dialogue with Christian, Islamic, and Asian faith traditions. Presenting information about the world's religious and ethnic diversity in a University setting of open dialogue to thoughtful students, young and old, can enrich overall understanding of the issues and challenges that confront us as we enter a new century.

College of Arts and Letters Graduate Courses

Course Prefixes

African Am. Studies – AAST
Anthropology – ANTR
Art Education – ARTE
Art History – ARTH
Studio Art – ARTS
Arts and Letters – AL
Asian Studies – ASIA
Communications – COMM
Criminal Justice – CRJS
Criminology – CRIM
Dance – DANCE
English – ENGL
Foreign Languages and Literatures — FL
Foreign Language in Eng Trans – ELET
 French – FR
 German – GER
 Japanese – JAPN
 Spanish – SPAN
Geography – GEOG
History – HIST
Humanities – HUM
International Studies – IS
Music – MUSIC
Applied Music – MUSA
Philosophy – PHIL
Political Science – POLS
Sociology – SOC
Theatre – THEA
Women's Studies - WMST

African-American Studies — AAST

AAST 497/597. Independent Study. 1-3 credits. Prerequisite: junior standing or permission of instructor. Students are exposed to opportunities to conduct independent research and/or study in areas focused on the political, social and cultural experiences of people of African descent in the U.S. and the African Diaspora.

Anthropology — ANTR

ANTR 495/595, 496/596. Topics in Anthropology. 1-3 credits each semester. Prerequisite: senior standing or approval of the department chair. A study of selected topics designed for either majors or nonmajors. These courses will appear in the course schedule, and will be more fully described in information distributed to all academic advisors.

ANTR 497/597, 498/598. Tutorial Work in Special Topics in Anthropology. 3 credits each semester. Prerequisites: senior standing and approval of department chair. Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

ANTR 695,696. Topics in Anthropology. 1-3 credits each semester. A study of selected topics for graduate students. The courses will appear in the course schedule, and will be more fully described in information sent to all graduate advisors.

ANTR 697, 698. Tutorial Work in Special Topics in Anthropology. 3 credits each semester. Independent reading and study on a topic to be selected under the direction of a member of the graduate faculty. Conferences and papers as appropriate.

Art Education — ARTE

ARTE 495/595. Topics in Art Education. 1-3 credits (depending on content). Prerequisite: permission of the instructor. Studies of selected topics designed for Art Education or elective credit. These courses will appear in the course schedule and will be more fully described in information distributed to all academic advisors.

Art History — ARTH

ARTH 421/521. Early Medieval Art. Lecture 3 hours; 3 credits. Prerequisite: ARTH 211 or permission of the instructor. The art and architecture of the Latin West and Byzantium from the early Christian centuries and the fall of Rome to the Carolingian and Ottoman empire and the fully developed Romanesque of the twelfth century, including manuscripts, metalwork, ivories and enamels.

ARTH 422/522. Gothic Art and Architecture. Lecture 3 hours; 3 credits. Prerequisite: ARTH 211 or permission of the instructor. The painting, sculpture, and architecture of the Gothic period from the mid-twelfth century to the refined and courtly art of the later International Style in France, England, Germany, and Italy as seen in both the monumental and the decorative arts.

ARTH 423/523. Romanesque Art and Architecture. Lecture 3 hours; 3 credits. Prerequisite: ARTH 211. This course will cover art of the period from about 1000 to 1150 in western Europe. The period witnessed the first "international style" of the Western Middle Ages from the first millennium up to the Gothic era. The style manifests in monumental architectural forms, monumental painting and increased book production.

ARTH 425/525. The Illuminated Manuscript. Lecture 3 hours; 3 credits. Prerequisite: ARTH 211 or permission of instructor. A study of the development of the illuminated manuscript from the form of the scroll in the ancient world to the fully illustrated and decorated codices (books) produced in the Middle Ages. A history of painting within the miniatures of the book from the early Christian era to the late Gothic period.

ARTH 434/534. Romantic Architecture. Lecture 3 hours; 3 credits. Prerequisite: ARTH 212. A survey of the aesthetic, technological and social forces that transformed international architecture in the 18th and 19th centuries.

ARTH 435W/535. Modern Architecture. Lecture 3 hours; 3 credits. Prerequisite: ARTH 212. An examination of the architecture, planning, and related design of the twentieth century around the globe. Special emphasis is placed on the formation of the international style between the world wars and its disintegration in the recent past.

ARTH 438/538. Fin de Siecle European Art. Lecture 3 hours; 3 credits. Prerequisite: ARTH 212. An intensive examination of the major styles, movements, and individuals working in Europe's avant-garde at the end of the 19th century to the beginning of the first world war.

ARTH 439/539. Art Between the Wars: 1919-1939. Lecture 3 hours; 3 credits. Prerequisites: ARTH 212, 324 or permission of instructor. A study of the international movements in visual arts and design in the interwar years from Dada to the New York World's Fair.

ARTH 440/540. Mid-Century Modern Art (1940-1960). Lecture 3 hours; 3 credits. Prerequisite: ARTH 212. An intensive study of the

two decades when modernist styles and theories in art, design, and architecture were codified and challenged internationally.

ARTH 460/560. Art Since 1960. Lecture 3 hours; 3 credits. Prerequisites: ARTH 212, 324 or permission of the instructor. Lectures and critical discussion of the development and configurations of the various styles emergent since 1960, both in America and Europe.

ARTH 495/595, 496/596. Topics in Art. 3 credits each semester. Prerequisite: appropriate survey or introductory courses or permission of the instructor. The advanced study of selected topics in art, designed to permit qualified students to investigate subjects, which due to their specialized nature, may not be offered regularly. The courses will appear in the course schedule, and will be more fully described in information distributed to all academic advisors.

ARTH 497/597, 498/598. Tutorial Work in Special Art Topics. 3 credits each semester. Prerequisites: senior standing and permission of the department chair. Independent research on a topic to be selected under the advisement of the instructor. Conferences, papers, and portfolios as appropriate.

ARTH 534. Romantic Architecture. Lecture 3 hours; 3 credits. Prerequisite: ARTH 212. A survey of the aesthetic, technological and social forces that transformed international architecture in the 18th and 19th centuries.

ARTH 600. Graduate Seminar: Art Criticism. Lecture 3 hours; 3 credits. Prerequisite: ARTH 212 or appropriate survey class from previous undergraduate institution. An examination of critical methodologies as they relate to art, with readings in the recent past and the contemporary scene. Required of all M.A. and M.F.A. students.

ARTH 695. Special Topics in Art History. Lecture 1-3 credits. Topics to be specified in the class schedule. Intensive critical investigations of specialized areas in art history. May be repeated for credit as topics vary.

ARTH 697. Tutorial in Art History. Lecture 1-3 credits. Individually arranged with the appropriate professor and with the permission of the graduate program director.

Studio Art — ARTS

ARTS 412/512. Photo Seminar 1. Lecture 1 hour; studio 5 hours; 3 credits. Prerequisites: ARTS 211, 311 and 411 or permission of the instructor. The first of a two-semester sequence of concentrated individual work. Students will identify a topic and create a complete body of work culminating in the senior show, ARTS 400. Lectures, readings, discussion, critique, and field trips to develop the articulation of ideas and the clarification of purpose.

ARTS 413/513. Photo Seminar 2. Lecture 1 hour; studio 5 hours; 3 credits. Prerequisites: ARTS 211, 311, 411 and 412 or permission of the instructor. This is the second in a two-semester sequence of concentrated individual work culminating in the senior show. Through readings, discussion, critiques, field trips, and intense individual work, students will compile a body of work realizing their personal vision and articulate their ideas through the crafting of an artist statement.

ARTS 431/531. Drawing Studio. Lecture 1 hour; studio 5 hours; 3 credits. Prerequisite: ARTS 331. Further concentration on conceptual content and drawing skills, development of individual body of work exploring preferred

concepts, subject matter, techniques, and media. May be repeated for credit.

ARTS 432/532. Figure Drawing Anatomy. Lecture 1 hour; studio 5 hours; 3 credits. Prerequisite: ARTS 331 or permission of the instructor. A study of visually important aspects of the structural, skeletal and muscular systems of the body. Anatomical study will be related to drawing from the live model.

ARTS 433/533. Figure Drawing/Composition. Lecture 1 hour; studio 5 hours; 3 credits. Prerequisite: ARTS 432/532. This course places the emphasis on advanced composition using the figure as the central theme. The figure's expressive potential, along with a study of historical responses to figure drawing, will be examined in depth.

ARTS 442/542. Painting Studio. Lecture 1 hour; studio 5 hours; 3 credits. Prerequisite: ARTS 441. Independent work in painting with focus on developing content. Frequent critiques. May be taken for repeat credit.

ARTS 450/550. Printmaking Studio. Lecture 1 hour; studio 5 hours; 3 credits. Prerequisite: ARTS 350 or permission of the instructor. Experimental work in selected print media. May be taken for repeat credit.

ARTS 461/561. Sculpture Studio. Lecture 1 hour; studio 5 hours; 3 credits. Prerequisite: ARTS 361 or 363, and permission of the instructor. Experimental work reflecting individual initiative and attitude.

ARTS 463/563. Advanced Ceramics. Lecture 1 hour; studio 5 hours; 3 credits. Prerequisites: ARTS 263 and 363. An advanced course in the science and art of ceramics. Students will engage in guided independent research, developing their own direction by investigating clay bodies, glazes, firing methods and contemporary ceramic art.

ARTS 464/564. Figurative Sculpture. Lecture 1 hour; studio 5 hours; 3 credits. Prerequisite: ARTS 263. Three-dimensional studies of the human figure working from the live model. Sketches will be used as the basis for sculptural forms in clay or other media.

ARTS 469/569. Assemblage. Lecture 1 hour; studio 5 hours; 3 credits. Prerequisite: junior standing or permission of the instructor. Assemblage combines elements of various art and non-art media and materials. Lectures will be comprised of presentations about relevant artists, gallery and studio visits, and critiques. Studio time allows students to explore personal directions in the medium.

ARTS 471/571. Graphic Design Studio. Lecture 1 hour; studio 5 hours; 3 credits. Prerequisite: ARTS 372. Intended to provide the student with advanced experience in graphic design topics. Students will solve complex design problems using multiple pieces coordinated to meet an overall communications objective. This course may be repeated for credit.

ARTS 473/573. The Book. Lecture 1 hour; studio 5 hours; 3 credits. Prerequisites: ARTS 202, 279, 304, and junior standing or permission of the instructor. The book as a work of art. Lecture will explore historical and technical aspects of book design and production. Studio work will be devoted to the production of a series of books involving page design, paper selection, printing and binding.

ARTS 475/575. Editorial Design. Lecture 1 hour; studio 5 hours; 3 credits. Prerequisite: ARTS 370 or permission of the instructor. An examination of the problems associated with the conception, design, and layout of newspapers,

newsletters, and magazines. Emphasis is placed on editorial position, content, audience, frequency, budget, and production methods.

ARTS 481/581. Crafts III: Fibers. Lecture 1 hour; studio 5 hours; 3 credits. Prerequisite: ARTS 381. Advanced work in pattern drafting, loom techniques, off-loom weaving and fabric painting.

ARTS 491/591. Crafts III: Metalsmithing and Jewelry. Lecture 1 hour; studio 5 hours; 3 credits. Prerequisite: ARTS 391. Further exploration in casting and soldering with concentration in the metal-forming techniques of raising and forging. Additional introduction to the techniques of working in steel.

ARTS 495/595. Topics in Studio Art. Lecture 1 hour; studio 5 hours; 3 credits. Prerequisite: permission of the instructor. The advanced study of selected topics designed to permit small groups of qualified students to work on studio projects of mutual interest.

ARTS 497/597. Tutorial Work in Special Studio Topics. 3 credits. Prerequisite: senior standing and permission of the chief departmental advisor. Independent investigation of a subject to be selected under the advisement of the instructor. Conferences, papers, field trips, portfolios, or exhibitions as appropriate.

ARTS 695. Graduate Seminar: Special Topics in Contemporary Art. 3 credits. Topics to be specified in the class schedule. Intensive critical investigations of selected aspects of the visual arts which focus on the role of the artist in contemporary urban society. May be repeated for credit as topics vary.

ARTS 697, 698. Graduate Studio. 3-6 credits. Permission of graduate program director required. Supervised individual inquiry in specific studio projects relating to the areas of major interest.

ARTS 700. Directed Field Experience. 3-6 credits. Permission of graduate program director required. Intern experiences in museums, community centers and arts programs, teaching assistantships, special apprenticeships, and field projects under the supervision of graduate faculty. Required of all M.F.A. candidates.

ARTS 701. Documentation. 3 credits. Permission of graduate program director required. Required of M.F.A. candidates. Course requirements to be determined by the student's advisory committee. Final grade to be determined by the student's thesis review committee.

ARTS 702. Thesis Exhibition. 3 credits. Permission of graduate program director required. Studio work in preparation for required graduate exhibition. Public exhibition to be approved by the student's advisory committee and must be accompanied by final review. Documentation may be required. Required of all M.A. and M.F.A. candidates. Final grade to be determined by the student's thesis review committee.

ARTS 797, 798. Graduate Studio. 3-6 credits. Permission of graduate program director required. Supervised individual inquiry in specific studio projects relating to areas of major interest. Individual studio spaces will be assigned.

The above list does not include graduate art courses taught at Norfolk State University. Consult the NSU Catalog for a current list of course offerings.

Arts and Letters — AL

AL 495/595. Topics in Humanities. 1-3 credits. Prerequisite: junior standing or

permission of the instructor. An advanced study of selected topics in humanities.

AL 496/596. Topics in Social Studies. 3 credits. Prerequisite: junior standing or permission of the instructor. An advanced study of selected topics in social studies.

AL 497/597. Tutorial Work in Arts and Letters Topics. 1-3 credits. Prerequisite: junior standing or permission of the instructor.

AL 795/895. Topics in Arts and Letters. 1-3 credits. Prerequisite: advanced graduate standing. Seminar on special interdisciplinary topics for small groups of qualified students.

AL 797. Tutorial Work in Arts and Letters Topics. 1-3 credits.

Asian Studies — ASIA

ASIA 495/595. Topics in Asian Studies. 1-3 credits. Prerequisites: appropriate survey source or permission of the instructor. This course is designed for small groups of qualified students to conduct advanced study of selected topics on Asian Studies, topics which may not be taught in regularly scheduled classes. The description of the course for each offering will appear in the course schedule that is distributed to each advisor.

Communication — COMM

COMM 400W/500. Intercultural Communication. Lecture 3 hours; 3 credits. Prerequisites: COMM 200S or permission of the instructor. With a goal of understanding the perspectives of other cultures and resolving possible conflicts, students will examine the role of perception, language, belief systems, social structures and culture practices. Applications will be made to specific cultures.

COMM 401/501. Communication Theory. Lecture 3 hours; 3 credits. Prerequisite: COMM 200S or permission of the instructor. An overview of general and contextual theories of communication. Focus is on the nature of communication theory, the role of theory in communication inquiry, and the relationships among theory, research, and practice.

COMM 402/502. Communication Research Methods II. Lecture 3 hours; 3 credits. Prerequisite: COMM 302. An advanced communication research methodology course emphasizing quantitative approaches to communication research. Students acquire skills necessary to conduct original communication research. Research project.

COMM 403/503. Public Relations and Crisis Communications. Lecture 3 hours; 3 credits. Prerequisite: COMM 303 or permission of instructor. This course introduces students to the basic elements of public relations as it pertains to assisting organizations avoid, mitigate and recover from crisis situations. Students will have the opportunity to both observe and participate in crisis communications situations.

COMM 405/505. Communication and Culture in the Middle East. Lecture 3 hours; 3 credits. Prerequisite: six hours of lower-level social science. The course examines the tensions between modernity and tradition in the context of Middle East culture. Cultural variables for study include myth and religion, family structures and the use of science and technology. (cross-listed with MIDE 405)

COMM 407/507. Communication and Culture in Southeast Asia. Lecture 3 hours; 3

credits. Prerequisite: 6 hours of lower level social science. Course provides theoretical models for examining the values, communication patterns and cultural perspectives of the peoples of Southeast Asia. Films, folklore, newspapers and literature from Southeast Asia will be investigated.

COMM 412W/512. Interpersonal Communication Theory and Research. Lecture 3 hours; 3 credits. Prerequisite: COMM 200S. A survey of classic and contemporary theories and research of communication in personal and social relationships across the lifespan. Emphasizes communication as a means to facilitate conditions for development of positive relational outcomes.

COMM 421/521. Communication and Conflict Management. Lecture 3 hours; 3 credits. Prerequisite: junior standing and COMM 200S or permission of the instructor. Focus on theory and research of communication processes in conflict episodes across social and personal relational contexts. Applications of communication approaches to conflict management emphasized.

COMM 425/525. Family Communication Theory and Research. Lecture 3 hours; 3 credits. Prerequisite: junior standing and COMM 200S or permission of the instructor. A survey of classic and contemporary theories and research of communication in family units, family relationships, and family interfacing with society. The course emphasizes communication in the social construction of evolving "family" realities as well as communication as means to facilitate conditions for development of positive domestic outcomes.

COMM 426/526. Group Communication Theory and Research. Lecture 3 hours; 3 credits. Prerequisites: COMM 200S and 326. A survey of classic and contemporary theories and research of communication in task groups as well as the interconnections of task groups with societal institutions such as the family, government, and health care. Communication factors that facilitate conditions for creating and maintaining optimally functioning groups are emphasized.

COMM 427/527. Children's Communication: Theory, Research, Applications. Lecture 3 hours; 3 credits. Prerequisite: COMM 200S or permission of instructor. A survey of theories and research of communication during childhood. Emphasis is on children as developing communicators, their relationships, and their interactions with media. Factors affecting optimal development of children's communication and development of applications to enhance children's communication development are emphasized.

COMM 434/534. African-American Rhetoric—Voices of Liberation. Lecture 3 hours; 3 credits. Prerequisite: COMM 200S or permission of the instructor. With the goals of examining the rhetorical strategies and their historical context, students will study and critique original speeches and various forms of discourse by African-American speakers.

COMM 444/544. German Cinema. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisite: COMM 270A. This course will focus on the German cinema from perspectives such as fascism and its legacy, film as historical critique, or Weimar cinema. (cross-listed with GER 445/545 and FLET 445/545)

COMM 445/545. Communication Analysis and Criticism. Lecture 3 hours; 3 credits. Prerequisite: COMM 200S or permission of the instructor. A survey of the key methods used in critiquing various forms of human and mediated

communication for the purpose of becoming more discerning consumers of public and mass mediated messages. Analysis will include films, television, and radio programs, advertisements, newspapers, public discourses, speeches, and conversations.

COMM 447W/547. Electronic Media Law and Policy. Lecture 3 hours; 3 credits. Prerequisite: COMM 360 or permission of the instructor. Course will focus on legal and policy issues related to modern media systems and technologies, with an emphasis on legal considerations of electronic media. Subjects will include First Amendment issues concerning news, programming, and advertising; station licensing; and challenges to traditional legal thought brought about by new technologies.

COMM 448/548. International Media Systems. Lecture 3 hours; 3 credits. Prerequisites: COMM 360, or permission of the instructor. An examination of the rise of broadcast technology and world flow of information and entertainment. Theory and policy issues of systems of broadcast ownership, access, regulation, programming, transborder, broadcasting and cultural imperialism and dominance of Western programming will be addressed.

COMM 450W/550. Remote Control: Women and Global TV Culture. Lecture 3 hours; 3 credits. Prerequisite: junior standing or permission of instructor. The course introduces students to women's participation in television industries across the world, as audience members, producers of programs, and subjects of television shows. Students will be trained in both feminist and media theories to understand the formation of contemporary national and global TV culture. (cross-listed with WMST 450W/550)

COMM 455/555. Critical Analysis of Journalism. Lecture 3 hours; 3 credits. Prerequisite: COMM 360 or permission of instructor. A critical examination of the news industry as practiced in the printed press, network and cable television, magazines, the Internet, and alternative press. Class examines the political economy of journalism, the sociology of journalistic practice, international news flows, ideological/political control of news, and mythological narrative forms within news.

COMM 456/556. Organizations and Social Influence. Lecture 3 hours; 3 credits. Prerequisites: COMM 333 or 355 or permission of the instructor. Focuses on theories, research and applications of the social influence function of communication in a variety of organizational contexts. Examines traditional and nontraditional social influence theories and research as applied to organizational change.

COMM 465/565. Mass Media and the National Elections. Lecture 3 hours; 3 credits. Prerequisite: COMM 360, junior standing, or permission of the instructor. Focuses on use of media in presidential elections from 1952 to the present. Topics include image creation and management, and the relationship between media and voting behavior.

COMM 467/567. Media, Politics and Civic Engagement. Lecture 3 hours; 3 credits. Prerequisite: COMM 360 or permission of instructor. Focuses on the ways in which citizens develop knowledge of, engage with, and practice politics through mass media and personal media forms. Students examine historical and contemporary practices of civic engagement and political organizing via media such as the alternative press, talk radio, rebel radio, letters-to-the-editor, the Internet, cinematic representations,

public access television, and others. Students seek to understand the power available to citizens for political engagement via mediated communication forms.

COMM 468/568. Communication and Political Symbolism. Lecture 3 hours; 3 credits. Prerequisite: COMM 360 or permission of instructor. The persistent communication and display of symbols and rituals of political meaning are central to how political power is built and legitimately exercised. This course examines such symbols and rituals by focusing on public rituals such as elections, the State of the Union address, and wars; political symbols such as the American and Confederate flag, Statue of Liberty, and television news; and institutions and practices related to public memory, such as war memorials, historical reenactments, museum and theme park displays, and firm narratives.

COMM 471W/571. International Film History. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisite: junior standing or permission of the instructor. An examination of world cinema as a technology, a business, an institution, and an art form from its inception to the present. Emphasis is on the narrative fiction film, its technological and aesthetic development, economic organization, and socio-cultural context. Representative classic and contemporary works will be screened and analyzed. (cross-listed with THEA 471W/571)

COMM 472T/572. New Media Technologies. Lecture 3 hours; 3 credits. Prerequisite: COMM 360 or permission of the instructor. Course will define and explain the new media which are changing the production and reception of information, entertainment, and interpersonal messages; explore the place of humankind in relation to technology; investigate the influence of the U.S. in the acquisition of new technology and access to the spectrum by developing nations.

COMM 473/573. Television and Society. Lecture 3 hours; 3 credits. Prerequisite: junior standing and COMM 360. The role of television in the cultural, psychological, and economic life of America. The structure and design of television programs; and the history and function of television in reinforcing or altering public perceptions of ideas, events, and people. Major critical approaches are employed in examining television's social impact and global reach.

COMM 474/574. Telecommunications Management. Lecture 3 hours; 3 credits. Prerequisite: junior standing, COMM 360, or permission of instructor. Course will introduce students to the principles of electronic media management, marketing, and promotion. Subjects will include the financing and economic structure of media organizations, personnel management, and the roles of media enterprises in the entertainment and information marketplaces.

COMM 477/577. Media Content Management. Lecture 3 hours; 3 credits. Prerequisite: junior standing, COMM 360, or permission of the instructor. An examination of the theory and practice of media programming techniques. Strategies and tactics to be studied include scheduling, program selection and development, and promotion. Television and radio will be emphasized, but new distribution platforms will also be considered.

COMM 478/578. Principles of Media Marketing and Promotion. Lecture 3 hours; 3 credits. Prerequisite: junior standing, COMM 360, or permission of the instructor. Course will introduce students to the ways in which different

media forms are used for advertising and marketing purposes. Emphasis is on electronic media, though other approaches, such as direct marketing techniques and the increasing use of new media technologies for marketing, will also be examined.

COMM 479/579. American Film History. Lecture 2 hours, laboratory 2 hours; 3 credits. Prerequisite: junior standing or permission of the instructor. An examination of American motion pictures as an art form, a business and an institution from its inception to the present. Primary attention is accorded to the narrative fiction film, its aesthetic and technological development, economic organization and social impact. This course highlights the many connections between film history and American culture. (cross-listed with THEA 479/579)

COMM 480/580. The Video Documentary II. Lecture 3 hours; 3 credits. Prerequisite: COMM/THEA 380. This is a production/studio course designed to complete the preparatory work developed in Theatre 380: The Video Documentary I. Discussion/presentation topics range from production field work to post-production editing. The final third of the semester will be devoted to compiling the rough footage in post production. (cross-listed with THEA 480/580)

COMM 481/581. The Documentary Tradition. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisite: COMM 360 or permission of instructor. An in-depth investigation of the history and theory of the documentary tradition in film, television, and radio. Examining both American and international examples, the course will look at major schools, movements, goals, and styles of documentary production. Representative texts will be studied for their socio-political influences, persuasive techniques, and aesthetic formulas.

COMM 486/586. Advanced Filmmaking. Lecture 3 hours; 3 credits. Prerequisites: COMM 346, 370, 385, and THEA 446, and 483. Offers the advanced film/video maker an opportunity to produce a project beyond the scope of previous classroom projects. Students come to the course in production teams (typically 5 members), with each member assigned a specific duty (cinematography, editing, directing, etc.). Students are permitted into the course solely by instructor approval and only after demonstration of superior skills in subordinate courses and acceptance of a submitted screenplay. (cross-listed with THEA 486/586)

COMM 495/595, 496/596. Topics in Communication. 3 credits each semester. Prerequisite: appropriate survey course or permission of the instructor. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule, and will be more fully described in information distributed to all academic advisors.

COMM 497/597, 498/598. Tutorial Work in Special Topics in Communication. 3 credits each semester. Prerequisites: senior standing and approval of the department chair. Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

COMM 600. Intercultural Communication: History, Theory and Application. Lecture 3 hours; 3 credits. Students will begin with an overview and then cover (1) past intercultural communication research, (2) the philosophical

underpinning and ethics behind intercultural communication research, and (3) current developments in intercultural communication theory. They will then address the application of intercultural communication theory in specific intercultural communication contexts (e.g. business, education, health and international travel).

COMM 607. Framing Theory. Lecture 3 hours; 3 credits. This course will investigate exant scholarship in framing theory and examine some real world applications of framing theory through case studies of how journalists cover news and the ways that "brand managers" position products and institutions.

COMM 615. Construction of the Gendered Body. Lecture 3 hours; 3 credits. This course will examine: (1) the nature-nurture controversy as reflected in current theories about gender as a significant factor in the transformation of physical bodies into social bodies, (2) cultural objects and institutions that shape our gender roles and expectations, and (3) nonverbal language and power and the status of the sexes.

COMM 630. The Information Society. Lecture 3 hours; 3 credits. This course explores the theories, questions, claims and myths that have accompanied the rise of new communication technologies and electronically derived digital information that define the "Electronic Revolution," also known as the Information Society. (cross-listed with HUM 630)

COMM 640. Television and Politics. Lecture 3 hours; 3 credits. This class closely examines television's role in shaping and reflecting contemporary American political culture, the conduct of foreign policy, and formal political processes, such as elections. (cross-listed with HUM 640)

COMM 650. Religious Communication. Lecture 3 hours; 3 credits. The seminar surveys the relationship between communication and religion with an emphasis on theory, research and applications. Topics may include the communication of religious beliefs/values via story, ritual, ceremony, worship, prayer and mediated communications.

COMM 672. New Communications Media and Social Development. Lecture 3 hours; 3 credits. Course explores the interaction between media technology deployment and social development in nations and sub-national groups. Special emphasis is placed on the paradigm of "networks" in both societies and technologies.

COMM 673. Television Histories as Collective Memory. Lecture 3 hours; 3 credits. This seminar explores the parameters and implications of "television as historian," examines the general nature of this widespread phenomenon, and analyzes mass mediated versions of the past and how and why they were constructed.

COMM 678. Race and Television. Lecture 3 hours; 3 credits. This course examines the relationships between race, racial identity and television. Multiple scholarly traditions are used to examine the interactions between television tests, audiences and institution and historical and contemporary race relations.

COMM 695. Topics in Communication. Lecture 3 hours; 3 credits. The study of selected topics designed to permit qualified students to work on subjects of mutual interest in a seminar format which, due to their specialized nature, may not be offered regularly.

COMM 697/698. Tutorial in Special Topics in Communication. Prerequisite: approval of

department chair. Independent reading and study of a topic under the direction of an instructor. Conferences and papers as appropriate.

COMM 795/895. Selected Topics in Communication Studies. Lecture 1-3 hours; 1-3 credits. Prerequisite: permission of instructor. The advanced study of selected topics in communication studies will be covered in such a way as to permit small groups of qualified students to study subjects of mutual interest which, due to their specialized nature, may not be offered regularly.

COMM 797/897. Independent Research in Communication Studies. 1-3 credit hours. Prerequisite: permission of instructor. Independent research directed by professors/faculty members examining communication topics.

Criminology — CRIM

CRIM 700/800. Proseminar in Criminology and Criminal Justice. Lecture 3 hours; 3 credits. This course provides students with a broad overview of enduring topics and emerging issues in criminology and criminal justice. It also explores the history and role of criminology as an academic discipline and criminal justice as an institutional system in American society.

CRIM 701/801. Criminology and Public Policy. Lecture 3 hours; 3 credits. To familiarize students with the policy process as it relates to crime legislation, criminological theory and implications for public policy.

CRIM 702/802. Advanced Criminological Theory. Lecture 3 hours; 3 credits. This course is an examination of criminological theory for the advanced student. The focus is on critical analysis of both contemporary and historical criminological theories. In order to aid in the development of a critical understanding of theory, beyond understanding the content of central theories, the class focuses on discussion of theory development and testing. In addition, the class focuses on an understanding of the relationship of one theory to another as well as the state of empirical evidence surrounding each theory.

CRIM 703/803. Inequality, Crime and Justice. Lecture 3 hours; 3 credits. To examine the linkages between social characteristics and crime. The course concentrates on what we know about the impact of gender, age, race and social class on crime and criminal justice.

CRIM 705/805. Multivariate Statistics in Criminological Research. Lecture 3 hours; 3 credits. This course teaches multivariate statistical techniques to train criminal justice researchers and policy makers to explore the causes and consequences of crime and criminal justice policies. Although the exact statistical techniques covered may vary, they will typically include multiple regression, multiple discriminate analysis, logistic regression, factor analysis, cluster analysis and path analysis.

CRIM 710/810. Qualitative Methods in Criminology and Criminal Justice. Lecture 3 hours; 3 credits. The central goal of this graduate seminar is to enable students to create and critique qualitative research designs focused on contemporary issues in criminology and criminal justice. A number of qualitative approaches will be covered including field observational research, focused interviews, case studies and content analysis. The seminar explores techniques, strengths and limitations of these varied qualitative methodologies.

CRIM 715/815. Life Course Criminology. Lecture 3 hours; 3 credits. This course is designed

to introduce graduate students to life-course perspectives for understanding crime and deviant behavior. We will discuss the various methodologies, both quantitative and qualitative, most commonly found in studies of the life course today.

CRIM 720/820. Advances Quantitative Techniques in Criminology & Criminal Justice. Lecture 3 hours; 3 credits. This course explores advances statistical techniques commonly used in research on crime and justice. The major focus of the course will be hierarchical linear modeling (HLM), a diverse set of techniques that extend standard multivariate analysis to accommodate nested data. Other advanced techniques will also be covered: event history/survival models, time series, etc.

CRIM 745/845. Crime and Communities. Lecture 3 hours; 3 credits. This course provides a foundation of the most important theories and research relating to residential communities and crime. The casual linkages between features of neighborhoods and social disorder will be explored in the context of criminological theories. Students will emerge with sufficient knowledge to develop a class or design a significant research project.

CRIM 750/850. Crimes of the State. Lecture 3 hours; 3 credits. This course explores crimes of states from a sociological and criminological perspective by examining historical and current cases of governmental crime. This will cover the history, theory and method of the field; controls of and constraints on state crime and; cases of state crime.

CRIM 890. Dissertation Research Seminar. Lecture 3 hours; 3 credits. This course facilitates students in developing a dissertation proposal for research in criminology and criminal justice.

Criminal Justice — CRJS

CRJS 401W/501. Understanding Violence. Lecture 3 hours; 3 credits. Prerequisite: CRJS 215S or SOC 201S or permission of the instructor. Examines a variety of forms of violence from suicide, child abuse, rape and family violence to terrorism, torture, death squads and the death penalty, and hate violence. Explores the circumstances, rationalizations, patterns, explanations and effects on survivors.

CRJS 410/510. Correctional Treatment. Lecture 3 hours; 3 credits. Prerequisites: CRJS 215S or 222 or permission of the instructor. Methods and programs which attempt to correct the behaviors of juvenile delinquents and adult criminal offenders are explored. Treatment strategies employed in both community and institutional settings are examined. Techniques of classification and the role of the correctional worker are also discussed.

CRJS 421/521. Deviant Behavior. Lecture 3 hours; 3 credits. Prerequisite: SOC 201S or CRJS 215S or permission of the instructor. A study of various definitions and forms of deviant behavior, theoretical explanations of causes of deviant behavior, and the impact of deviant behavior on society and the individual. (cross-listed with SOC 421/521)

CRJS 426W/526. Criminological Theory. Lecture 3 hours; 3 credits. Prerequisites: CRJS 215S and senior standing, or permission of the instructor. An in-depth study of the major theoretical issues in criminology. Deals extensively with issues of crime causation.

CRJS 427/527. Violence Against Women. Lecture 3 hours; 3 credits. Prerequisite: SOC 201S or CRJS 215S or completion of the social science

perspective or permission of the instructor. A critical analysis of violence against women as an institution of social control. Examines violence in the context of social and political inequality and feminist critique. Issues explored include pornography, prostitution, sexual harassment, incest, battering and rape. (cross-listed with SOC 427/527)

CRJS 441/541. Drugs and Society. Lecture 3 hours; 3 credits. Prerequisite: SOC 201S or CRJS 215S. The study of sociological and social psychological explanations of drug-using behaviors and of legal and medical control of drugs. Topics include changes in the legal status of drugs, cross-cultural and historical variations in the control of drugs, and social epidemiology of drug use in contemporary society. (cross-listed with SOC 441/541)

CRJS 448/548. Women, Sex Discrimination and the Law. Lecture 3 hours; 3 credits. Prerequisite: CRJS 215S or permission of the instructor. This course introduces students to legal issues which specifically affect women and examines historical attitudes that have been used to justify differential treatment of women. It explores various legal approaches used to achieve equal protection under the law and examines a variety of specific topics such as: the equal protection analysis; Title VII and Title IX and their relationship to sex discrimination; affirmative action; and reproductive freedom.

CRJS 450/550. Blacks, Crime and Justice. Lecture 3 hours; 3 credits. Prerequisites: CRJS 215S and 222 or permission of the instructor. Examines historical and contemporary theories and research on African-Americans, criminal behavior and the administration of justice. Selected topics will include African-American perspectives, the death penalty, victimization, police brutality, and justice systems in Africa and the Caribbean.

CRJS 462/562. Substantive Criminal Law. Lecture and discussion 3 hours; 3 credits. Prerequisite: CRJS 215S or 222 or permission of the instructor. This course deals with the major substantive concepts involved in American criminal law, including development of criminal law, elements of criminal liability, defenses against criminal responsibility, and descriptions and definitions of specific offenses.

CRJS 475/575. Criminal Justice Systems Around the World. Lecture 3 hours; 3 credits. Prerequisite: CRJS 215S or 222 or permission of the instructor. The study of criminal justice systems around the world in order to understand how criminal behavior is defined and responded to in various cultures. Cultural differences will be highlighted in order to recognize that definitions of and responses to crimes closely reflect the cultures in which they exist.

CRJS 495/595, 496/596. Topics in Criminal Justice. 3 credits each semester. Prerequisite: CRJS 215S or permission of the instructor. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule, and will be more fully described in information distributed to all academic advisors.

CRJS 497/597, 498/598. Tutorial Work in Special Topics in Criminal Justice. 1-3 credits. Prerequisites: senior standing and approval of the department chair. Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

CRJS 610. Applied Social Research Methods. Lecture 3 hours; 3 credits. The application of social science methods to practical problems. The topics of research design, measurement, scaling, sampling, data collection, and research organization will be taught with reference to issues of reliability, validity and ethical concerns. (cross-listed with SOC 610)

CRJS 620. Criminological Theory. Lecture 3 hours; 3 credits. An in-depth study of the major theoretical issues in criminology. The course deals extensively with issues of crime causation, the way theory shapes and informs the study of crime and related social issues, and the relationship between theory, research, and practice.

CRJS 625. The Administration of Criminal Justice. Lecture 3 hours; 3 credits. An analysis of the criminal justice system with an emphasis on the decision-making responsibilities of its officials.

CRJS 626. Seminar on Special Problems in Criminal Justice. Lecture 3 hours; 3 credits. An opportunity for a small group of graduate students to study in depth some of the major issues confronting criminal justice today.

CRJS 627. Violence Against Women. Lecture 3 hours; 3 credits. This course examines the many ways in which violence against women functions as an agent of social control. Violence is viewed on a continuum in order to determine how a variety of acts contribute to the subordination of women. Specific types of violence are explored including: wife assault, rape, incest, sexual harassment and pornography. (cross-listed with SOC 627)

CRJS 630. Applied Social Statistics. Lecture 3 hours; 3 credits. Prerequisite: SOC 610 or CRJS 610. This course is a graduate-level introduction to social statistics as they may be applied to various practical problems. Students will learn the appropriate use of various statistical procedures through discussion and application. (cross-listed with SOC 630)

CRJS 640. Sociological Application of Computer and Data Analysis. Lecture and laboratory 3 hours; 3 credits. Prerequisite: SOC 610 or CRJS 610. This course is a graduate-level introduction to the use of the computer in problems of data management and analysis. Students will use existing software packages (SPSS, SAS) to build specified data files and carry out various statistical procedures. (cross listed with SOC 640)

CRJS 644. Current Feminist Research in Criminal Justice. Lecture 3 hours; 3 credits. The course provides a feminist analysis of the way women and gender traditionally have been studied in mainstream criminal justice. A minimum of one-third of the course is devoted to a feminist critique of conventional conceptual and methodological approaches to gender relations in the social sciences. Feminist epistemological challenges are used to evaluate current research on selected topics reflecting the specialization and research interest of the faculty who teach the course. (cross-listed with SOC 644)

CRJS 650. Research Seminar. 3 credits. Prerequisites: SOC 610 or CRJS 610, SOC 620 or CRJS 620, SOC 630 or CRJS 630, and SOC 640 or CRJS 640. This seminar integrates the skills needed to complete a master's thesis. Exercises include formulating research questions, developing a research design, and writing a publishable paper. Students practice these skills assignments in class and by completing their thesis proposal. (cross-listed with SOC 650)

CRJS 660. Justice Seminar. Lecture 3 hours; 3 credits. Prerequisites: CRJS 610, 620, 630, 640,

6 hours of CRJS electives. An examination of contemporary research and policy issues in criminology and criminal justice. Special emphasis is placed upon recent developments in the field.

CRJS 661. Policing. Lecture 3 hours; 3 credits. A study of the major issues in law enforcement agencies, personnel and strategies. Topics focus on the impact of social control on the officers and society.

CRJS 662. Criminal Justice and the Law. Lecture 3 hours; 3 credits. A study of law and its interpretation as it affects the criminal justice system. Includes such issues as the substance of criminal law and the criminal court setting as a social system.

CRJS 663. Corrections. Lecture 3 hours; 3 credits. A study of society's response to crime through its use of institutional and noninstitutional corrections. Topics include inmate culture, correction officer behavior and community corrections programs.

CRJS 668. Internship. 3 credits. Prerequisite: permission of the instructor. Students gain first-hand experience in professional settings which are deemed appropriate given their academic background and career objectives. Students will be required to complete a research project which corresponds to their specific internship placement.

CRJS 695/696. Topics in Criminal Justice. Lecture 3 hours; 3 credits. Advanced seminars on selected topics in criminal justice. Topics will vary by semester.

CRJS 697/698. Independent Study in Special Topics in Criminal Justice. 3 credits. Prerequisite: approval of the department chair. Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

CRJS 699. Thesis. 3-9 credits.

CRJS 795/895. Topics in Criminal Justice. Lecture 3 hours; 3 credits. Prerequisite: 6 hours of graduate credit. Topics will vary by semester.

CRJS 797/897. Independent Study in Criminal Justice. 3 credits. Prerequisites: approval of department chair and 6 hours of graduate credit. Independent reading and study on a topic to be selected under the direction of an instructor.

Dance - See Theatre and Dance

English — ENGL

SUMMARY OF COURSE DISTRIBUTION

I. Composition and Professional Writing. 527, 535, 539, 555, 664, 665, 668, 685, 686, 687.

II. Creative Writing. 551, 552, 554, 557, 650, 660, 661, 694.

III. Language Studies and Linguistics. 540, 544, 550, 577, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679.

IV. Journalism. 572, 580, 581, 583, 584, 585, 586.

V. Literature and Film. 503, 507, 516, 521, 523, 524, 525, 532, 533, 537, 538, 546, 547, 548, 559, 560, 561, 562, 563, 565, 566, 592, 593, 600, 605, 615, 632, 641, 645, 647, 655, 656, 657, 658, 659.

VI. Teaching. 555, 664, 665, 687.

VII. Non-Lecture Courses. 668, 674, 675, 696, 698, 699.

VIII. Topics Courses. 595, 596, 695.

ENGL 403/503. Medieval Literature. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-level literature course or permission of instructor. An introduction to representative works of English literature (some in translation) from *Beowulf* through Chaucer's *Canterbury Tales*, *The Book of Margery Kempe*, *The Second Shepherd's Play*, and Malory's *Morte d'Arthur*. Students will discover how medieval literature has contributed to and continues to complicate modern conceptions of reading, writing, and aesthetics.

ENGL 406/506. The Teaching of Literature. Lecture 3 hours; 3 credits. Prerequisite: ENGL 333. This course is designed to provide an intensive examination of issues, approaches, and methods utilized in the teaching of literature, particularly literature written for children and young adults.

ENGL 407/507. Chaucer's Canterbury Tales. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and three semester hours in literature. A study of *The Canterbury Tales* with an introduction to Middle English language and culture.

ENGL 416/516. English Renaissance Drama. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-level literature course or permission of instructor. An extensive survey of the secular national dramas of Renaissance England that were written and performed by Shakespeare's contemporaries in London between 1576 and 1642. Students study the literary features, social contexts and ideological underpinning of representative works by Kyd, Marlowe, Jonson, Webster, Ford, and others.

ENGL 421/521. British Literature 1660-1800. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-level literature course or permission of instructor. British literature from the Restoration of the monarchy after the Civil War and Puritan Commonwealth to the French Revolution, focusing on how cultural changes (legalized female actors, commercialized printing, colonialism, and growing market capitalism) interacted with the flowering of satire and scandalous theatrical comedy, and the emergence of modern literary forms (periodical journalism, "picturesque" poetry, and the novel).

ENGL 423/523. The Romantic Movement in Britain. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-level literature course or permission of instructor. A study of the literature written in Britain between 1770-1830, focusing on how the literary experiments and innovations of poets like Blake, Wordsworth, Coleridge, Byron, Percy Shelley, Keats, Burns, and Barbauld, and of novelists like Mary Shelley, Radcliffe, and Scott interacted with cultural changes such as the Industrial Revolution, the French Revolution, and the emergence of feminism and working-class radicalism.

ENGL 424/524. Short Works in Narrative Media. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and ENGL 312 or permission of instructor. This course examines short narrative forms in

film, video, literature, and multi-media. Individual works will be considered, both for the specific ways in which they make use of the medium in which they appear and for the qualities they share. Particular emphasis will be placed on the relationship between writing and visualization. Students will engage in both creative and critical exercises, so as to see the process from both sides: creative production and critical analysis.

ENGL 425/525. World Film Directors in Context. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and ENGL 312 or permission of instructor. This course will explore the works of several directors from a variety of world regions. Films will be considered as part of the body of work by each director, as well as in the context of the regions' other arts, traditions, popular culture, and historical events. Students will become familiar, therefore, with aesthetic, literary, sociological, anthropological and historical approaches to the analysis of film.

ENGL 427W/527. Writing in the Disciplines. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test, 9 hours of English including completion of the 6-hour General Education composition requirement and 3 additional hours of English. This writing intensive course emphasizes contexts and strategies of text production in and across academic disciplines and professional settings.

ENGL 432/532. Origins and Early Development of the British Novel to 1800. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-level literature course or permission of instructor. A study of early novels and how the novel developed from other traditions such as the epic, romance, criminal biography, and travel narrative.

ENGL 433/533. Victorian Literature. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-level literature course or permission of instructor. A study of the chief writers and the cultural and philosophical backgrounds of the Victorian era, touching on the changes from the early to the later part of the period. Works analyzed include fiction, nonfiction prose, and poetry.

ENGL 435W/535. Management Writing. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and six semester hours in English, to include ENGL 334W or permission of the instructor. This course focuses on writing as a means of making and presenting management decisions.

ENGL 437/537. The Nineteenth-Century British Novel. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-level literature course or permission of instructor. A study of 19th-century British novels in context of the economic, social, and political issues of the period, emphasizing their formal and aesthetic concerns.

ENGL 438/538. The Twentieth-Century British Novel. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-level literature course or permission of instructor. Examination and analysis of a variety of novels in their editorial and cultural contexts.

ENGL 439W/539. Writing in Electronic Environments. Lecture 3 hours; 3 credits. Prerequisite: ENGL 307 or equivalent or permission of instructor. This course offers

composition practice in critical contemporary digital environments. The class will especially emphasize new media composition. Reading and discussion will provide a history and critical theory of new media. Students should expect to create a range of new media including web sites, and engage in critical discussion about this work. English 325 recommended.

ENGL 440/540. General Linguistics. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and three semester hours in English beyond ENGL 110C. A comprehensive view of the study of linguistics and an introduction to the linguist's approach to language.

ENGL 444/544. History of the English Language. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-level linguistics course or permission of the instructor. A study of the origins and development of the English language. Primary focus is on the internal history, emphasizing the continuity and change in successive stages of the language.

ENGL 446/546. Studies in American Drama. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and 300-level literature course, ENGL 340 preferred. With rotating topics, this course will pursue particular themes or periods in American drama and theater. Potential areas of inquiry might include melodrama, the early transatlantic stage, rise of stage realism, age of O'Neill, or the contemporary drama.

ENGL 447/547. The American Novel to 1920. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-level literature course, ENGL 345 preferred. Examination of the American novel from its origins in the late eighteenth century through World War I. The course will emphasize the novel as a genre, cultural trends during the period, and such relevant literary modes as romanticism, realism, and naturalism.

ENGL 448/548. The American Novel, 1920 to Present. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-level literature course, ENGL 346 preferred. Examination of the American novel from the end of World War I to the present day. The course will emphasize formal issues related to the genre of the novel and relevant literary and cultural trends during the period including modernism and postmodernism.

ENGL 449/549. Craft of Literary Nonfiction. Lecture 3 hours; 3 credits. Prerequisite: six semester hours in literature or three semester hours in literature and ENGL 300 or permission of the instructor. A detailed study of technique in literary nonfiction with an emphasis on the memoir, the essay, reportage, and travel narrative. Especially designed for, but not limited to, creative writing students; supplements the creative writing workshops.

ENGL 450/550. American English. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-level linguistics course or permission of the instructor. In this course, we will study the geographical, social, and stylistic diversity of English spoken in the United States. We will also investigate how perception of dialect diversity affects access to education and other socioeconomic opportunities.

ENGL 451/551. Advanced Fiction Workshop. Lecture 3 hours; 3 credits (may be

repeated for credit). Prerequisites: passing score on the Writing Sample Placement Test, ENGL 351 and junior standing or permission of the instructor, based on writing samples submitted. This course, an expansion of the principles and techniques learned in ENGL 351, focuses on the writing and criticism of the short story, the novella, and the novel.

ENGL 452/552. Advanced Poetry Workshop. Lecture 3 hours; 3 credits (may be repeated for credit). Prerequisites: passing score on the Writing Sample Placement Test, ENGL 352 and junior standing or permission of the instructor, based on writing samples submitted. This course, an expansion of the principles and techniques learned in ENGL 352, focuses on the writing and criticism of poetry.

ENGL 454/554. Creative Nonfiction. Lecture 3 hours; 3 credits (may be repeated for credit). Prerequisites: passing score on the Writing Sample Placement Test, ENGL 327W or 351 and junior standing or permission of the instructor, based on writing samples submitted. A course in the techniques of writing nonfiction imaginatively within a factual context. Emphasis is placed on concern for reader psychology, selection of significant detail, and the development of a style at once lively and lucid. Assignments are made individually with regard to the student's field of interest—history, biography, science, politics, informal essay, etc. Advice is given on the marketing of promising manuscripts.

ENGL 455/555. The Teaching of Composition, Grades 6-12. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and twelve semester hours in English to include ENGL 327W. A study of the theory and practice of teaching writing. Special attention will be given to the ways effective teachers allow theories and experiences to inform their pedagogical strategies.

ENGL 459/559. New Literatures in English. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and junior standing. A study of the diverse "new" literatures in English of the Caribbean and Central America, Africa, India, as well as of Canada and Australia, in their current historical and political contexts.

ENGL 460/560. The Literature of Fact. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-level literature course or permission of instructor. A detailed study of the literary tradition of creative nonfiction.

ENGL 461/561. Poetry of the Early Twentieth Century. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-level literature course or permission of instructor. Works of major British and American poets from 1900 to 1945 are studied.

ENGL 462/562. Sacred Texts as Literature. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test, literature perspective requirement and six-hour general education composition requirement or permission of instructor. A study of how sacred texts reshape a variety of literary forms (narratives, drama, poetry, biography, history). The course may focus on a particular text or a collection of texts drawn from a variety of faith traditions and/or spiritual experiences.

ENGL 463/563. Women Writers. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-

level literature course or permission of instructor. This course applies concepts developed through women's studies scholarship and feminist literary criticism to works by women writers of different races and cultures.

ENGL 465/565. African-American Literature. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-level literature course or permission of instructor. An investigation of the ways in which literary movements, historical events, social transitions, and political upheavals have influenced African-American literature.

ENGL 466W/566. Asian American Literature. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and 466W for students, one 300-level literature course. The course introduces students to key texts in Asian American literature, supported by critical studies (and on occasion films) to interrogate the theme of Asian American identities in their multiple forms. The course will examine sociopolitical histories that undercut the literature, and the contributions of Asian American writers to the breadth and scope of American as well as global literatures today.

ENGL 472/572. America in Vietnam: The Government and the Media in Conflict. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test, ENGL 110C and junior standing, or permission of the instructor. An examination of America's role in Vietnam and how the interaction of the media with political and military leaders shaped the subsequent foreign policy decisions and military conduct.

ENGL 473/573. Writing with Video. Lecture 3 hours; 3 credits. Prerequisite: ENGL 307. This course engages students in a comprehensive exploration of video as a rhetorical narrative medium, with emphasis on the actual production of video work. Writing is also integrated into the production process. From brainstorming to storyboarding and critique, writing is positioned as an integral part of the course.

ENGL 477/577. Language, Gender and Power. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test, junior standing and three upper division hours in English, or permission of the instructor. This interdisciplinary course explores how language reflects and interacts with society, with particular emphasis on gender and race. Topics include definition, framing, stereotypes, language taboos, and powerful and powerless language.

ENGL 480/580. Investigative Reporting Techniques. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and ENGL 380. This course will acquaint students with electronic research skills essential to the practice of print and broadcast journalism. With a focus on both high tech and traditional research skills, the course will provide instruction in the uses of computer-assisted reporting, spreadsheet and database analysis programs, locating databases compiled by government agencies, filing requests through the Freedom of Information Act, and following paper trails to records of courthouse, property, and corporate public filings.

ENGL 481/581. Advanced Public Relations. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and ENGL 381 or permission of the instructor. Designed to strengthen the skills of the public relations practitioner with emphasis on the creative aspects of problem solving. Attention is given to

crisis public relations, interviewing, speech writing, and graphics.

ENGL 482/582. Sports Journalism. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test, ENGL 110C and 111C. This is primarily a sportswriting course in which students are introduced to various types and styles of sports stories that are representative of sports journalism as practiced in newspapers and magazines. The course also explores the role of sports in American society.

ENGL 483W/583. Advanced News Reporting. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and ENGL 380 or permission of instructor. Designed to familiarize students with the rudiments of beat reporting, including such areas as coverage of the criminal justice system, city government, business and labor, health and the environment, the arts and culture, and science and technology. Students will also receive instruction in the use of public records. Guest lectures by reporters who work on these beats.

ENGL 484/584. Feature Story Writing. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and nine semester hours in English. Course includes discussion and practice of writing a variety of newspaper and magazine feature stories. Students will write and critique stories on people, places, businesses, trends, and issues. Assistance is given in the marketing of manuscripts.

ENGL 485W/585. Editorial and Persuasive Writing. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and nine semester hours in English, to include ENGL 380 or 484. A study of the practice and function of writing editorials and other commentary for newspapers. Assignments include the writing of editorials, columns, and reviews. Lectures will include the techniques of crafting a persuasive argument, an analysis of the content of newspaper editorials, and guest lectures by newspaper editorial writers and columnists.

ENGL 486/586. Media Law and Ethics. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and junior standing or permission of the instructor. Designed to introduce students to components of communication law that may affect the professional writer or broadcaster. Topics include defamation, constitutional constraints, freedom of information, privacy, copyright, and telecommunications law. Ethical issues relating to the mass media will also be examined.

ENGL 492/592. Modern World Drama. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-level literature course or permission of the instructor. A study of selected major dramatic works of the world, including the non-Western world. Works written in languages other than English will be read in translation. The course begins with Ibsen in the late nineteenth century and continues to the present.

ENGL 493/593. Contemporary World Literature. Lecture 3 hours; 3 credits. Prerequisites: passing score on the Writing Sample Placement Test and one 300-level literature course or permission of the instructor. Fiction, poetry, and plays written during the last fifty years in nations throughout the world. Most texts will have been written originally in languages other than English. Emphasis is on the universality of the human experience as depicted in a variety of cultures.

ENGL 495/595, 496/596. Topics in English. 1-3 credits each semester. Prerequisites: passing score on the Writing Sample Placement Test and three semester hours in literature. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, because of their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described in information distributed to all academic advisors.

ENGL 600. Introduction to Research and Criticism. Lecture 3 hours; 3 credits. Required of most graduate students in English, usually in the first semester. Survey of English as an academic discipline; issues and trends in scholarly journals; research strategies and conventions for graduate-level papers and master's theses; critical approaches to literature.

ENGL 615. Shakespeare. Lecture 3 hours; 3 credits. An application of advanced theoretical and critical approaches to Shakespeare's works. May be repeated more than once for credit if different group of works or themes is being studied.

ENGL 632. Eighteenth-Century British Literature. Lecture 3 hours; 3 credits. A study of the literature written in the British Isles from the "Glorious Revolution" of 1688 until 1800, focusing on how the flowering of satire and the emergence of literary forms such as periodical journalism, "picturesque" poetry, and the novel interacted with the growth of distinctly modern institutions and philosophies such as a free, commercial press, market capitalism, colonialism, political radicalism, and industrialism.

ENGL 641. Nineteenth-Century British Literature. Lecture 3 hours; 3 credits. A study of a selection of the literature written in Britain during the romantic and Victorian ages, focusing on the social, historical, and ideological contexts informing its production. Texts analyzed include poetry, fiction, and nonfiction.

ENGL 645. Twentieth-Century British Literature. Lecture 3 hours; 3 credits. Studies of major poets, dramatists and prose writers. Some attention will be given to the movements, trends, forces, and ideas of the period.

ENGL 647. Postcolonial Literature and Theory. Lecture 3 hours; 3 credits. An introduction to the discourse of anti-colonial critical theory through the literature produced in countries outside of Europe and the West.

ENGL 650. Creative Writing. Lecture 3 hours; 3 credits. Prerequisites: Admission to the MFA program and permission of the instructor. Guided study and practice in writing short stories, novels, poetry, and creative nonfiction, offered in specific sections of Fiction, Poetry, and Nonfiction. This course can be repeated for credit. Students planning to write a creative thesis must take this course at least twice with their thesis director.

ENGL 655. Topics in World Literature. Lecture 3 hours; 3 credits. Examination of a theme, genre, or other literary topic as it appears in the literature of several countries. All works are assigned in English translation if not originally written in English. Specific topics are listed in the schedule booklet, and course descriptions appear in a booklet distributed to all academic advisors.

ENGL 656. American Literature to 1810. Lecture 3 hours; 3 credits. Intensive study of a variety of texts from several genres reflecting the historical forces, aesthetic movements, social trends, and representative works of the period.

ENGL 657. American Literature 1810-1870. Lecture 3 hours; 3 credits. Intensive study of a

variety of texts from several genres reflecting the historical forces, aesthetic movements, social trends, and representative works of the period.

ENGL 658. American Literature 1870-1945. Lecture 3 hours; 3 credits. Intensive study of a variety of texts from several genres reflecting the historical forces, aesthetic movements, social trends, and representative works of the period.

ENGL 659. American Literature 1945-Present. Lecture 3 hours; 3 credits. Intensive study of a variety of texts from several genres reflecting the historical forces, aesthetic movements, social trends, and representative works of the period.

ENGL 660. Craft of Narrative. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. A detailed study of the techniques of fiction and nonfiction with some emphasis given to the various theories informing the genres.

ENGL 661. Craft of Poetry. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. A detailed study of the techniques of poetry with some emphasis on the various theories informing the genre.

ENGL 662. Cybercultures and Digital Writing. Lecture 3 hours; 3 credits. Prerequisite: three units of digital writing or instructor's permission. In this course, students will explore the social, theoretical, and cultural implications of composing with the ever-evolving digital writing technologies. They will also consider how to study the practices the writers use to compose with these technologies.

ENGL 664. Teaching College Composition. Lecture 3 hours; 3 credits. An intensive examination of alternative approaches to teaching first-year and advanced composition at the college level, with special attention to current schools of composition theory and research.

ENGL 665. Teaching Writing with Technology. Lecture 3 hours; 3 credits. Prerequisite: ENGL 439W/539 or either ENGL 455/555 or ENGL 664. Students in this course will explore different writing environments and educational applications and learn how they are designed to help writers compose, collaborate, research, and think. Students will assess the values and theoretical assumptions underlying those applications and learn to articulate their own philosophies of using technologies in the writing classroom.

ENGL 668. Graduate Internship and Project in Professional Writing. 3 credits. Prerequisites: 15 graduate credits in English. Structured work experience involving extensive writing and editing in a professional setting. The result of the internship is an analytic paper and a portfolio of written work.

ENGL 670. Methods and Materials in TESOL. Lecture 3 hours; 3 credits. A practical introduction to methods, materials, and course organization in TESOL (Teaching English to Speakers of Other Languages). The course includes language assessment and teaching language in its cultural context as well as technology-enhanced language teaching.

ENGL 671. Phonology. Lecture 3 hours; 3 credits. Prerequisite: ENGL 440/540 or permission of the instructor. An examination of the sound systems of natural languages, with emphasis on English and how it differs from other languages. The course includes articulatory and acoustic phonetics with analyses of data and exercises in transcription, as well as introduction to different phonological theories and their assumptions and notations.

ENGL 672. Syntax. Lecture 3 hours; 3 credits. Prerequisite: ENGL 440/540 or permission of the instructor. An examination of the syntactic structures, morphology, and semantics of natural languages, with emphasis on English. Practice in syntactic analysis and formal description. Comparison of current syntactic and semantic theories.

ENGL 673. Discourse Analysis. Lecture 3 hours; 3 credits. Prerequisite: ENGL 440/540 or permission of the instructor. A survey of various concepts and issues related to analyzing the structure of spoken and written discourse in English: the intonation unit, the verbalization of given and new information, conversational analysis, textual cohesion, speech act theory, and scripts and schemes in narratives.

ENGL 674. Internship in Applied Linguistics. 3 credits. Prerequisite: 12 graduate credits in linguistics. A structured work experience involving teaching or work in applied linguistics in a professional setting. To be documented by a portfolio of written work.

ENGL 675. Practicum in TESOL. 3 credits. Prerequisites: ENGL 670 and permission of the instructor. Supervised practice in teaching English to speakers of other languages. Available to those enrolled in the M.A. in Applied Linguistics or TESOL Certificate who have completed core courses.

ENGL 676. Semantics. Lecture 3 hours; 3 credits. Prerequisite: ENGL 440/540 or permission of the instructor. An advanced survey of meaning in language. Consideration of how best to characterize linguistic meaning, relationships between meaning, culture, and cognition (categorization, metaphor), word and sentence meaning, and interpretation of meaning in context (pragmatics, indexicality).

ENGL 677. Language and Communication Across Cultures. Lecture 3 hours; 3 credits. An investigation of how language and cultural differences affect communication. Readings from linguistics, anthropology, and literature address problems of intercultural communication.

ENGL 678. Sociolinguistics. Lecture 3 hours; 3 credits. Prerequisite: any upper-division linguistics course or permission of instructor. Sociolinguistics is the study of language in its social context with emphasis on ethnography and other qualitative methods, quantitative methods, and linguistic and social differentiation between individuals and groups.

ENGL 679. First and Second Language Acquisition. Lecture 3 hours; 3 credits. An investigation of first and second language acquisition with emphasis on examining evidence about second language learning which supports or fails to support different approaches to teaching a second language.

ENGL 680. Second Language Writing Pedagogy. Lecture 3 hours; 3 credits. Students will engage in many of the theoretical debates about teaching L2 writers, as well as practical responses to these debates. With this knowledge students will be prepared to enter the debate, teach L2 writers, and so research on L2 writers and writing.

ENGL 685. Writing Research. Lecture 3 hours; 3 credits. Prerequisites: 6 graduate credits in English. This course explores current methods and methodologies in writing research. Students will design and carry out original studies of academic, professional, or personal writing as it is practiced in classrooms, work places, and other settings.

ENGL 686. Introduction to Rhetoric and Writing Studies. Lecture 3 hours; 3 credits. This course presents key concepts, principles, traditions, and conversations that define the field of rhetoric and composition, surveying major texts, movements, issues, and methodologies. This course is designed primarily to prepare students for advanced courses in professional writing; however, it will also benefit any student who is interested in gaining insights about language, knowledge, and power from the perspective of rhetoric.

ENGL 687. Colloquium for Teachers of English. Lecture 3 hours; 3 credits. Study and discussion of recent research in and new materials for the teaching of English. May be repeated for credit when topic varies.

ENGL 694. Thesis Colloquium. Lecture 3 hours; 3 credits. Prerequisite: can be taken after 24 graduate hours have been completed. All MFA students are required to take ENGL 694 before their final semester. The course brings together all genres in a collaborative focus in which students discuss specific thesis projects, format requirements, publishing opportunities and reading lists for the 10-page prefatory essay required for their defense.

ENGL 695. Topics. 3 credits. The advanced study of a selected topic in English. Topics courses will appear in the course schedule and will be more fully described in information distributed to all academic advisors.

ENGL 696. Independent Readings. 3 credits. Designed for the advanced student (15-20 hours) who wants to study in-depth a sharply focused area of literature, linguistics, or pedagogy. Before registering for the course, the student must make out a prospectus with the instructor and submit it. No graduate student is permitted to take more than two independent readings courses.

ENGL 698-699. Thesis. 3 credits each semester.

ENGL 701/801. Texts and Technologies. Lecture 3 hours; 3 credits. Tracing the development of writing technologies from Ancient Greece through contemporary blogs and wikis, this course focuses on the relationships between a text's physical qualities and its composition, production, and reception.

ENGL 705/805. Discourse and Rhetoric Across Cultures. Lecture 3 hours; 3 credits. Prerequisite: admission into the Applied Linguistics M.A. or the Ph.D. in English. The course is an introduction to cultural linguistics and to theories underlying some of the major strands of empirical and philosophical studies of language: structuralism, generative grammar, speech acts, cognitive linguistics, discourse, narrative, semantics, pragmatics, metaphor, and translation.

ENGL 706/806. Visual Rhetoric and Document Design. Lecture 3 hours; 3 credits. This course focuses on how visual elements, whether verbal or graphic, work within different types of documents. Theory and research in visual rhetoric and technical communication will be used to develop models for how people process visual information in terms of a variety of social and cultural contexts.

ENGL 710/810. Major Debates in English Studies. Lecture 3 hours; 3 credits. This course introduces students to the principal questions and concerns of the field and includes a comparison and contrast of the subspecialties in English, including how they form and address key issues.

ENGL 715/815. Professional Writing Theories and Practices. Lecture 3 hours; 3 credits. This course surveys the history of

professional writing, competing theories and research methodologies in the field. The tensions between workplace practices, professional writing scholarship, and professional writing pedagogy will also be explored.

ENGL 716/816. Professional Writing in/for International Contexts. Lecture 3 hours; 3 credits. Prerequisite: ENGL 715/815. This course focuses on the linguistic and cultural factors that business writers and technical writers must consider when working with/for global audiences. Students will learn to approach cross-cultural communication as a process that starts with researching the target audience.

ENGL 720/820. Pedagogy and Instructional Design. Lecture 3 hours; 3 credits. Prerequisite: ENGL 664 or equivalent. Students in this course will be prepared to develop pedagogical plans, teach and assess writing in four instructional areas: advanced and professional writing courses, writing across the curriculum, workplace instruction, and distributed learning. New pedagogical tools—especially computer-based technologies—will be taught, analyzed and tested.

ENGL 721/821. Compositions as Applied Rhetoric. Lecture 3 hours; 3 credits. Prerequisite: 3 credits of a graduate level rhetoric or composition course or instructor's permission. Students will examine how the field of rhetoric has shaped composition pedagogy in the United States from its inception at Harvard to postmodern possibilities of today's writing classroom.

ENGL 725/825. Scholarly Editing and Textual Scholarship. Lecture 3 hours; 3 credits. Instructor approval required. Surveys the theory and practice of scholarly editing, of the physical description of texts as material artifacts, and of the historical and social contextualization of texts as material artifacts. Focus is on texts produced in manuscripts and print, but consideration is given to oral texts and digital texts.

ENGL 740/840. Empirical Research Methods and Project Design. Lecture 3 hours; 3 credits. This course focuses on the theory and design of empirical research conducted in academic and nonacademic settings. Students will examine the methodological complexities of ethnography, meta-analysis, feminist research and other approaches.

ENGL 750/850. Service Learning in English Studies. Lecture 3 hours; 3 credits. Instructor approval required. Students will engage in service-learning activities and apply various concepts and skills from their experience and coursework to identify and respond to the needs in the community. An analytical paper and portfolio of service-learning materials are required.

ENGL 760/860. Classical Rhetoric and Theory Building. Lecture 3 hours; 3 credits. Analysis and discussion of classical theories of rhetoric, with attention to how rhetoric describes discourse in the public sphere.

ENGL 763/863. Seminar in Discourse Analysis. Lecture 3 hours; 3 credits. Prerequisite: ENGL 705/805 or permission of the instructor. This course focuses on relationships among language users, text, grammar, context, and purpose within a discourse perspective. Readings and assignments emphasize theoretical and methodological issues related to interactive discourse, registers and genres, narrative and identity, and language, ideology and power.

ENGL 764/864. Theories of Literature. Lecture 3 hours; 3 credits. An in-depth study of selected theories about the form, history, and cultural significance of literature, such as narrative

theory, poststructuralism, Marxism, and feminism. Specific topics may vary by semester, but all sections will engage comprehensively with a body of theoretical texts and concerns.

ENGL 765/865. Modern Rhetoric and Theory Building. Lecture 3 hours; 3 credits. Prerequisite: ENGL 600 or equivalent. This course concerns the development of rhetoric as an academic discipline in the twentieth century, in particular how rhetoric has distinguished itself from literary, historical, philosophical, and linguistic modes of inquiry.

ENGL 766/866. New Media Theory and Practice I. Lecture 3 hours; 3 credits. Prerequisite: ENGL 539 or equivalent. This course involves hands-on instruction in a variety of software packages used to create websites and multi-media projects. Students will explore the rhetorical, literary, and technical aspects of their own projects as well as other web-based and multi-media compositions/products.

ENGL 770/870. Research Methods in Applied Linguistics. Lecture 3 hours; 3 credits. Prerequisite: ENGL 540 or permission of the instructor. This course introduces basic concepts, methods, and techniques used to investigate topics and problems in applied linguistics. Both quantitative and qualitative approaches are presented. Methods include surveys, ethnographies, case studies, and experimental designs. Two major goals are emphasized: to become better readers of research reports and develop research and analytical skills applicable to applied linguistics and related fields.

ENGL 771/871. New Media Theory and Practice II. Lecture 3 hours; 3 credits. Prerequisite: ENGL 766/866. This course builds on the study of new media textual production and consumption in English Studies begun in New Media Theory and Practice I and gives students the opportunity to engage in more advanced theoretical and production work. This course will focus on the integration of multiple modes and media using a variety of software and hardware.

ENGL 773/873. Seminar in Discourse Analysis. Lecture 3 hours; 3 credits. Instructor approval required. Prerequisite: ENGL 705/805. This course focuses on relationships among language users, text, grammar, context, and purpose within a discourse perspective. Readings and assignments emphasize theoretical and methodological issues related to interactive discourse, registers and genres, narrative and identity, and language, ideology and power.

ENGL 778/878. Seminar in Sociolinguistics. Lecture 3 hours; 3 credits. This survey course investigates socially meaningful language variation. Topics include: social variation, language ideologies, language and authority, and style.

ENGL 783/883. Seminar in Professional Writing. Lecture 3 hours; 3 credits. Prerequisite: Instructor approval. This course will provide an intensive examination of a specific topic or issue in professional writing and serve as a field course for Professional Writing and New Media.

ENGL 790/890. Seminar in Textual Studies. Lecture 3 hours; 3 credits. Prerequisite: Instructor approval. This course will provide an intensive examination of a specific topic or issue in textual studies and serve as a field course for Rhetoric and Textual Studies.

ENGL 791/891. Seminar in Literary Studies. Lecture 3 hours; 3 credits. Intensive seminar in a variable literary or literary-cultural topic.

ENGL 793/893. Seminar in Rhetoric. Lecture 3 hours; 3 credits. Prerequisite: Instructor approval. This course will provide an intensive examination of a specific topic or issue in rhetoric and serve as a field course for Rhetoric and Textual Studies.

ENGL 794/894. Seminar in New Media. Lecture 3 hours; 3 credits. Prerequisite: Instructor approval. This course will provide an intensive examination of a specific topic or issue in new media and serve as a field course for Professional Writing and New Media.

ENGL 795/895. Topics. 3 credits. Prerequisite: students must be enrolled in doctoral program to take this course. Variable course material for students in PhD in English degree program.

ENGL 797/897. Independent Study in English. Hours to be arranged; 3 credits. Prerequisite: graduate standing. Provides opportunities for doctoral students to do independent research in areas of their interests.

ENGL 892. Dissertation Seminar. Lecture 3 hours; 3 credits. Prerequisite: All core, field, and elective coursework must be completed prior to enrollment. This course is taken prior to doctoral candidacy exams. It enables students to develop and refine a topic for the dissertation, do preliminary research, and construct a bibliography under the guidance of a faculty mentor. Students will also use the seminar to prepare bibliographies to be used in candidacy exam.

ENGL 898. Directed Research. 1-9 credits. Prerequisite: instructor approval. This course can be taken as a supplement to the Dissertation Seminar for independent investigation in the topic for dissertation.

ENGL 899. Dissertation. 1-9 credits. Prerequisite: 885 Dissertation Seminar and passing Candidacy examination. This course is to be taken only by students who have passed the candidacy exams for the purpose of researching and writing the dissertation.

ENGL 999. English 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Foreign Languages and Literatures — FL

FL 495/595, 496/596. Topics in Foreign Languages. 1-3 credits each semester. Prerequisite: permission of the instructor or, in the case of 595, graduate standing. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the schedule and will be more fully described by academic advisors.

Foreign Literatures in English Translation — FLET

FLET 410W/510. Berlin-Paris: Crucibles of European Ideas. Lecture 3 hours; 3 credits. Prerequisite: junior standing, completion of the literature perspective, or permission of the instructor. This course explores the cultural movements that have characterized the German-French commonalities and differences from the

early 1900s through the 1990s in cross-disciplinary discourses such as film, literature, art, politics, and economics.

FLET 445/545. German Cinema. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisite: junior standing. This course will focus on the German cinema from perspectives such as fascism and its legacy, film as historical critique, or Weimar cinema. (Cross-listed with GER 445/545 and COMM 444/544)

FLET 471/571. Hispanic Women Authors. Lecture 3 hours; 3 credits. Prerequisite: junior standing, completion of the literary perspective, or permission of the instructor. A study of fictional and non-fictional works by Spanish, Spanish-American, and U.S. Latina writers from the 16th to the 20th century. The course analyzes gender identity and roles and the interaction of gender, race, and class in literary representations of courtship and marriage, spirituality, nationalism, colonialism, and multiculturalism. (cross-listed with SPAN 471/571)

FLET 476/576. German-Jewish Literature and Culture. Lecture 3 hours; 3 credits. Prerequisite: junior standing. A survey of seminal texts by German-Jewish authors from the Enlightenment to the present day, including figures such as Marx, Kafka, Freud, Schnitzler and Arendt. Course is in English. (cross-listed with GER 476/576)

FLET 495/595, 496/596. Topics in Foreign Literature in English Translation. 1-3 credits each semester. Prerequisite: junior standing, completion of the literary perspective, or permission of the instructor. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described by academic advisors.

French — FR

FR 407/507. Advanced Grammar and Syntax. Lecture 3 hours; 3 credits. Prerequisite: FR 312W or permission of the department chair. An intensive study of French grammar and development of style through activities, including theme, version, composition, and dictation.

FR 410W/510. Berlin-Paris: Crucibles of European Ideas. Lecture 3 hours; 3 credits. Prerequisite: French students must read and write in the target language. This course explores the cultural movements that have characterized the German-French commonalities and differences from the early 1900s through the 1990s in cross-disciplinary discourses such as film, literature, art, politics, and economics. Cross-listed with FLET 410W/510.

FR 415/515. Applied Phonetics. Lecture 3 hours; 3 credits. Prerequisite: FR 311 or 312W or permission of the department chair. Designed to develop the mastery of spoken French. Intensive study of French phonetics with exercises in pronunciation and its application to media comprehension.

FR 420/520. Francophone Civilization. Lecture 3 hours; 3 credits. Prerequisites: FR 311, 312W or 320. A study of the culture and civilization of the main Francophone countries, the Magreb, West Africa, La Republique Malgache, the Caribbean Islands, Canada, Belgium, and

Switzerland, through selected cultural readings, art, music and literature.

FR 427/527. Studies in Seventeenth-Century French Literature. Lecture 3 hours; 3 credits. Prerequisite: senior standing or permission of the department chair. Following a preparatory period, the political stability of the French monarchy ushers in the golden age of classicism. Representative works from comic and dramatic theater, philosophy, poetry and the evolving novel.

FR 428/528. Studies in Eighteenth-Century French Literature. Lecture 3 hours; 3 credits. Prerequisite: senior standing or permission of the department chair. A study of the two main currents of ideas of the Age of Reason or Enlightenment; the rationalistic drive to question established authority, exemplified by the "Encyclopedie" and leading to the Revolution of 1789; and the Rousseauistic return to nature and emotivity. Representative readings.

FR 437/537. Studies in Nineteenth-Century French Literature. Lecture 3 hours; 3 credits. Prerequisite: senior standing or permission of the department chair. A study of the post-Revolutionary (1789) literary movements: Romanticism, Realism, Naturalism, Symbolism, which opened new horizons of modern science and culture in France. Representative works.

FR 438/538. Studies in Twentieth-Century French Literature. Lecture 3 hours; 3 credits. Prerequisite: senior standing or permission of the department chair. A study of the greatness and decadence of modern man trapped in the wild "belle epoque," then in two savage World Wars, and finally in the inhuman Nuclear Age. Reflecting great scientific advances, the vast new horizons to be discovered are mainly inward: Dadaism, Surrealism, Existentialism, Literature of the Absurd, Structuralism focus on the anguish, absurdity, and madness of modern life.

FR 469/569. A History of French Cinema. Lecture 3 hours; 3 credits. Prerequisite: FR 311 or 312W or permission of instructor. This course will function as a survey of French film classics from the birth of cinema through contemporary times, and also shed light on various French cultural and literary movements as they are represented in film (Surrealism, WWII, Nouvelle Vague, decolonization).

FR 495/595, 496/596. Topics in French. 1-3 credits each semester. Prerequisite: appropriate survey course or permission of the instructor. The advanced study of the selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described by academic advisors.

FR 695/696. Topics in French. Lecture 1-9 hours; 1-9 credits. Prerequisite: graduate standing. Advanced study of selected topics which may not be offered regularly. These courses appear in the course schedule booklet and are more fully described in a supplement distributed to graduate program directors.

FR 697/698. Tutorial Work in Special Topics in French. 1-3 credits. Prerequisites: graduate standing and approval of project. This course will allow an individual student to pursue a special topic or project under the guidance of a professor.

German — GER

GER 407/507. Advanced Grammar and Syntax. Lecture 3 hours; 3 credits. Prerequisites: GER 311 and 312W, or permission of the

department chair. This course deals with idioms and the fine points of grammar with the aim of helping students to develop a good style in written German. Special problems of non-native speakers are analyzed and treated individually.

GER 408/508. Conversation and Composition. Lecture 3 hours; 3 credits. Prerequisites: GER 311 and 312W, or permission of the department chair. Designed to develop the mastery of spoken and written German. Recommended for prospective teachers.

GER 410W/510. Berlin-Paris: Crucibles of European Ideas. Lecture 3 hours; 3 credits. Prerequisite: German students must read and write in the target language. This course explores the cultural movements that have characterized the German-French commonalities and differences from the early 1900s through the 1990s in cross-disciplinary discourses such as film, literature, art, politics, and economics. Cross-listed with FLET 410W/510.

GER 420/520. Masterpieces of German Poetry. Lecture 3 hours; 3 credits. Prerequisites: GER 311 and 312W, or permission of instructor. The course will focus on exemplary poems of distinct cultural periods, ranging from the courtly love tradition of the Middle Ages to the political poetry surrounding the fall of the Berlin Wall.

GER 445/545. German Cinema. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisite: GER 311 or 312W or permission of instructor. This course will focus on the German cinema from perspectives such as fascism and its legacy, film as historical critique, or Weimar cinema. (Cross-listed with FLET 445/545 and COMM 444/544)

GER 450/550. German Satires and Parodies. Lecture 3 hours; 3 credits. Prerequisites: GER 311 and 312W, or permission of instructor. The course will analyze satirical features and parodic strategies in exemplary literature and visual texts from late medieval carnival plays to contemporary cabaret. Texts include excerpts from Brant's *Ship of Fools*, examples of romantic irony in Bonaventura and Heine, the graphic art of caricature from Reformation broad sheets to today's political cartoons, as well as literary parodies from Wagnerian opera to Viennese chanson.

GER 455/555. Germany 1900-1945: From High Culture to Holocaust. Lecture 3 hours; 3 credits. Prerequisites: GER 311 and 312W. A study of representative works from the last years of the Austro-Hungarian Empire, the Wilhelmine Empire and the Weimar Republic, including Freud, Hofmannsthal, Kafka, Brecht, Hesse, Thomas Mann et al. The course will also discuss literature illustrating the genesis and ideology of the Third Reich.

GER 470/570. Post World War II Germany. Lecture 3 hours; 3 credits. Prerequisite: GER 311 or 312W. The course will cover representative literary texts and cultural events of divided and united Germany, including Heinrich Böll, Günter Grass, Max Frisch, Christa Wolf, Doris Dörrie et al, as well as film, painting, popular music, the culture of memory and German Jewish relations after the Shoah.

GER 473/573. The Enlightenment and Its Critics. Lecture 3 hours; 3 credits. Prerequisite: GER 311 or 312W. This course focuses on German intellectual history as represented by thinkers such as Lessing, Kant, Hegel, Marx, Nietzsche, and Freud. More recent works by Frankfurt School writers Adorno and Horkheimer represent critical engagements with the tenets of the European Enlightenment.

GER 476/576. German-Jewish Literature and Culture. Lecture 3 hours; 3 credits. Prerequisite: junior standing. A survey of seminal texts by German-Jewish authors from the Enlightenment to the present day, including figures such as Marx, Kafka, Freud, Schnitzler and Arendt. (cross-listed with FLET 476/576)

GER 478/578. German Drama. Lecture 3 hours; 3 credits. Prerequisites: GER 311 and 312W. An exploration of German dramatic works ranging from the Enlightenment period to contemporary drama. Students will read individual works by authors such as Lessing, Goethe, Schiller, Hebbel, Brecht, or Jelinek as well as texts concerned with the function of drama in German culture by these and other authors.

GER 495/595, 496/596. Topics in German. 1-3 credits each semester. Prerequisite: appropriate survey course or permission of the instructor. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described by academic advisors.

GER 695/696. Topics in German. Lecture 1-9 hours; 1-9 credits. Prerequisite: graduate standing. Advanced study of selected topics which may not be offered regularly. These appear in the course schedule booklet and are more fully described in a supplement distributed to graduate program directors.

GER 697/698. Tutorial Work. 3 credits. Prerequisites: graduate standing and approval of project. This course will allow an individual student to pursue a special topic or project under the guidance of a professor.

Japanese — JAPN

JAPN 495/595, 496/596. Topics in Japanese. 1-3 credits each semester. Prerequisite: third-year Japanese or permission of the instructor. A study of selected topics in Japanese. These courses will appear in the course schedule and will be more fully described by academic advisors.

Spanish — SPAN

SPAN 407/507. Advanced Grammar and Syntax. Lecture 3 hours; 3 credits. Prerequisite: 9 hours of 300-level Spanish courses. Designed to refine competence in grammar and style in the process of writing various types of essays.

SPAN 410/510. Spanish Applied Linguistics. Lecture 3 hours; 3 credits. Prerequisite: 9 hours of 300-level Spanish courses. Course is an introduction to Spanish linguistics and its application to the teaching and learning of Spanish. Topics include Spanish syntax, semantics, phonetics, and pragmatics and their practical applications to language learning.

SPAN 415/515. Spanish Phonetics. Lecture 3 hours; 3 credits. Prerequisite: 9 hours of 300-level Spanish courses. A study of the sound system of Spanish from both theoretical and applied perspectives. Intensive practice in pronunciation and contrastive analysis of Spanish and English.

SPAN 447/547. Drama of the Spanish Golden Age. Lecture 3 hours; 3 credits. Prerequisite: 9 hours of 300-level Spanish courses. A study of selected works of the major playwrights of the Golden Age: Lope de Vega, Calderon de la Barca, Tirso de Molina, Ruiz de Alarcon.

SPAN 448/548. Contemporary Spanish Drama. Lecture 3 hours; 3 credits. Prerequisite: 9 hours of 300-level Spanish courses. A study of contemporary Spanish playwrights since Federico García Lorca.

SPAN 449/549. Contemporary Spanish-American Drama. Lecture 3 hours; 3 credits. Prerequisite: 9 hours of 300-level Spanish courses. A study of contemporary Spanish-American drama through the reading of representative authors.

SPAN 464/564. The Contemporary Novel in Spanish America. Lecture 3 hours; 3 credits. Prerequisite: 9 hours of 300-level Spanish courses. A study of the Spanish-American novel since the Mexican revolution. Reading of representative works.

SPAN 465/565. The Spanish-American Short Story. Lecture 3 hours; 3 credits. Prerequisite: 9 hours of 300-level Spanish courses. A study of the Spanish American short story with readings from the 16th to the 20th centuries.

SPAN 466/566. The Spanish Short Story. Lecture 3 hours; 3 credits. Prerequisite: 9 hours of 300-level Spanish courses. A study of the development of the short story in Spain involving writers from the 15th century to the present.

SPAN 467/567. Cervantes. Lecture 3 hours; 3 credits. Prerequisite: 9 hours of 300-level Spanish courses. A study of the principal works of the foremost Spanish novelist, including *Don Quijote*, *Novelas Ejemplares*, and selected theatrical works.

SPAN 468/568. The Spanish Novel. Lecture 3 hours; 3 credits. Prerequisite: 9 hours of 300-level Spanish courses. Study of the Spanish novel from Don Quijote to modern times.

SPAN 469/569. Hispanic Film. Lecture 3 hours; 3 credits. Prerequisite: 9 hours of 300-level Spanish courses. A topical study of the major works of Spanish and Latin American film from Bunuel to the present. The course will explore many issues, including those related to gender, race, symbolism, and class struggle.

SPAN 471/571. Hispanic Women Authors. Lecture 3 hours; 3 credits. Prerequisite: 9 hours of 300-level Spanish courses. A study of fictional and non-fictional works by Spanish, Spanish-American, and U.S. Latina writers from the 16th to the 20th century. The course analyzes gender identity and roles and the interaction of gender, race, and class in literary representations of courtship and marriage, spirituality, nationalism, colonialism, and multiculturalism. (cross-listed with FLET 471/571)

SPAN 473/573. Contemporary Latina Literature: From Borders to Crossroads. Lecture 3 hours; 3 credits. Prerequisite: 9 hours of 300-level Spanish courses. The course focuses on poetry, prose fiction and theater written by Chicana, Puerto Rican, Cuban-American, and Dominican-American women authors in the last twenty years. Attention will also be paid to the very influential theoretical work written by Chicanas.

SPAN 495/595, 496/596. Topics in Spanish. 1-3 credits each semester. Prerequisite: 9 hours of 300-level Spanish courses. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described by academic advisors.

SPAN 602. Intensive Spanish for Teachers: Language and Culture. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. This course is designed for Spanish teachers interested

in keeping up with cultural developments in the Spanish-speaking world and in maintaining/improving linguistic performance. Emphasis will be placed on authentic materials from newspapers, magazines, film and video, and the Internet.

SPAN 695/696. Topics in Spanish. Lecture 1-9 hours; 1-9 credits. Prerequisite: graduate standing. Advanced study of selected topics which may not be offered regularly. These courses appear in the course schedule booklet and are more fully described in supplements distributed to graduate program directors.

SPAN 697/698. Tutorial Work in Special Topics in Spanish. 1-3 credits. Prerequisites: graduate standing and approval of the department chair. The independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

Geography — GEOG

GEOG 400W/500. Seminar in Geography. Lecture and discussion 3 hours; 3 credits. Prerequisite: GEOG 100S or 101S, or permission of the instructor. Advanced study of a specialized topic in geography. The choice of the topic may vary according to the availability of faculty expertise and student interest.

GEOG 402/502. Geographic Information Systems. Lecture 3 hours; 3 credits. Prerequisite: junior standing or permission of instructor. A study of the conceptual basis of GIS as a tool for manipulating spatial information. The course focuses on how geographic information can be input and organized within the framework of a GIS. Students will work on a computer-based GIS to gain a greater understanding of spatial database structures and analytical operations.

GEOG 404/504. Digital Techniques for Remote Sensing. Lecture 3 hours; 3 credits. Prerequisite: junior standing or permission of instructor. Study of the theory and application of remote sensing, emphasizing environmental applications and aerial and satellite imagery. Covers the fundamentals of multispectral digital image processing, including sensors pre-processing, enhancement, classification, accuracy assessment, and GIS data integration.

GEOG 405W/505. Seminar in International Resource Management. Lecture and discussion 3 hours; 3 credits. Prerequisite: GEOG 100S or 101S; 305 recommended. Discussion of the ecological and management principles underlying international resource management and the goal of attaining a sustainable, ecologically balanced world.

GEOG 408/508. Cartography. Lecture and discussion 3 hours; 3 credits. Prerequisite: GEOG 300 or 402 or CS 149D. Computer-assisted methods and techniques employed in the design, construction, and use of maps and other graphics as tools for data analysis and communication.

GEOG 410W/510. Seminar in Urban Geography. Lecture and discussion 3 hours; 3 credits. Prerequisite: GEOG 100S or 101S, or permission of the instructor. Discussion of specific urban and metropolitan problems based on outside readings and individually selected research topics.

GEOG 411/511. Urban and Regional Planning. Lecture and discussion 3 hours; 3 credits. Prerequisite: GEOG 100S or 101S, or permission of the instructor. A study of planning concepts and powers used to guide contemporary metropolitan growth and development. Emphasis is on the application of social science principles and methods to the planning process.

GEOG 412/512. Cities of the World. Lecture and discussion 3 hours; 3 credits. Prerequisite: junior standing or permission of the instructor. An examination of cities of the world's major cultural realms with an emphasis on the urban landscape as it varies between developed and developing countries.

GEOG 419/519. Spatial Analysis of Coastal Environments. Lecture 1.5 hours; laboratory 3 hours; 3 credits. Prerequisite: OEAS 414. The course integrates remotely sensed and field techniques for scientific investigation and practical management of coastal environmental systems. Spatial modeling of coastal processes and management tools using Geographic Information System (GIS).

GEOG 420/520. Marine Geography. Lecture and discussion 3 hours; 3 credits. Prerequisites: junior standing and six credits in the social sciences, or permission of the instructor. An analysis of human-sea relationships with particular emphasis on resource management and political organization from global, regional, and national perspectives.

GEOG 422W/522. Coastal Geography. Lecture 3 hours; 3 credits. Prerequisites: GEOG 100S or 101S, or permission of the instructor. An examination of the physical and human geography of the coastal zone. Considers problems of managing coastal resources with an emphasis on North America.

GEOG 425/525. Internet Geographic Information Systems. Lecture 3 hours; 3 credits. Prerequisite: GEOG 402/502. Theoretical and practical exploration of methods, standards, and policies related to the development and utilization of geographic information systems on the Internet. Students will create and utilize distributed geospatial data and analytical systems using the WWW and the Internet to address geographical problems.

GEOG 432/532. Advanced GIS. Lecture 3 hours; 3 credits. Prerequisite: GEOG 402/502. The study of a series of advanced topics in the field of geographic information systems/science. Focus is placed on the development of projects/models and a survey of several advanced techniques. Students will work on a computer based GIS to implement topics from lectures.

GEOG 451/551. Europe. Lecture and discussion 3 hours; 3 credits. Prerequisites: junior standing and GEOG 100S or 101S, or permission of the instructor. A geographical analysis of the interrelationships among physical, cultural, economic, and political factors in Europe.

GEOG 452/552. Africa. Lecture and discussion 3 hours; 3 credits. Prerequisites: junior standing and GEOG 100S or 101S, or permission of the instructor. A geographical analysis of the interrelationships among physical, cultural, economic, and political factors in Africa.

GEOG 453/553. Asia. Lecture and discussion 3 hours; 3 credits. Prerequisites: junior standing and GEOG 100S or 101S, or permission of the instructor. A geographical analysis of the interrelationships among physical, cultural, economic, and political factors in Asia excluding the Middle East and the former USSR.

GEOG 454W/554. Latin America. Lecture 3 hours; 3 credits. Prerequisites: junior standing and GEOG 100S or 101S or permission of the instructor. A geographical analysis of the interrelationships among physical, cultural, economic, and political factors in Latin America.

GEOG 455/555. The Middle East. Lecture and discussion 3 hours; 3 credits. Prerequisites:

junior standing and GEOG 100S or 101S, or permission of the instructor. A geographical analysis of the interrelationships among physical, cultural, economic, and political factors in the Middle East.

GEOG 456/556. Geography of Southeast Asia. Lecture 3 hours; 3 credits. Prerequisite: GEOG 100S. Analysis of the physical, historical, cultural, economic, environmental, and political patterns and problems of Southeast Asia. The focus is on the diversity of the region and on the nature and impact of development.

GEOG 458/558. Geography of Virginia. Lecture and discussion 3 hours; 3 credits. Prerequisite: GEOG 100S or 101S. An analysis of Virginia's population, resources, and regional landscapes as they have been influenced by physical, cultural, historical, and economic factors.

GEOG 490/590. Applied Cartography/GIS. 1-3 credits. Prerequisite: junior standing or permission of the instructor. Practical experience in applying the principles of cartography and geographical information systems to the design and construction of maps and other graphics.

GEOG 495/595, 496/596. Topics in Geography. 1-4 credits each semester. Prerequisite: appropriate survey course or permission of the instructor. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule, and will be more fully described in information distributed to all academic advisors.

GEOG 497/597. Independent Research in Geography. 1-3 credits. Prerequisite: senior standing and approval of the director of geography and department chair. Independent reading and study on a topic to be selected under the direction of the instructor. Conferences and papers as appropriate.

GEOG 620. Seminar in Political Geography. Lecture and discussion 3 hours; 3 credits. A study of the interrelationships of political and geographic phenomena, and theories of geopolitics; examines in a seminar format the political geography both of specific topics such as the national integration of states, refugees and resources, and of particular regions of the world.

GEOG 625. Ethno-Regionalism. Lecture 3 hours; 3 credits. An examination of the geopolitics of world ethnic minorities with special reference to selected "trouble spots" on the world political map.

GEOG 650. Seminar in Regional Geography. 1-3 credits. Advanced seminar on a particular country or world region.

GEOG 695, 696. Topics in Geography. 1-3 credits each semester. Advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest.

GEOG 697. Independent Research in Geography. 1-3 credits. Independent research in geography under the supervision of a faculty member.

History — HIST

HIST 405/505. History of International Relations: Nineteenth Century Systems. Lecture 3 hours; 3 credits. Prerequisite: HIST 101H, 102H, 103H, 104H or 105H. Focuses on the evolution of international politics, diplomacy, and social, cultural, and economic structures between 1792 and 1914. Explores the relationship among the European powers and their relations with smaller states in Europe and spheres of

influence around the world. Internationalist initiatives by various groups operating within the European states system are investigated.

HIST 408/508. War and American Society in the Twentieth Century. Lecture 3 hours; 3 credits. Prerequisite: HIST 101H, 102H, 103H, 104H or 105H. An exploration of the content and meaning of wartime experiences within American society between 1898 and 1975. Emphasis is on comparing the levels of national, institutional and personal experiences of war as they affected people at home and in battle, and on considering the relationships between warmaking and social development at particular times.

HIST 420/520. Fascism in Europe. Lecture 3 hours; 3 credits. Prerequisite: HIST 101H, 102H, 103H, 104H or 105H. Explores the genesis and development of fascism in Europe between World Wars I and II. Particular emphasis on Fascism in Italy and National Socialism in Germany. Appeal of fascist movements to populations across the socio-economic spectrum, fluidities of ideology and practice, fascism's impact on political, economic, social, and cultural life in the interwar period are explored.

HIST 439/539. Politics and Society in East Asia Since 1945. Lecture 3 hours; 3 credits. Prerequisite: HIST 101H, 102H, 103H, 104H or 105H. Political and social developments in Japan, China, and Korea since the end of World War II.

HIST 445/545. History of Early American Thought. Lecture 3 hours; 3 credits. Prerequisite: HIST 101H, 102H, 103H, 104H or 105H. Development of religious, political, philosophical, and literary thought in the period between the founding of Massachusetts Bay and the beginning of the Civil War.

HIST 455/555. African-American Historiography. Lecture 3 hours; 3 credits. Prerequisite: HIST 101H, 102H, 103H, 104H or 105H. Examination of the ways historians have addressed specific issues in African-American history.

HIST 456/556. Research in Local History. Lecture 3 hours; 3 credits. Prerequisite: HIST 101H, 102H, 103H, 104H or 105H. Explores the history of Hampton Roads through student use of research materials.

HIST 470/570. Democracy and Development in Modern Latin America. Lecture 3 hours; 3 credits. Prerequisite: HIST 101H, 102H, 103H, 104H or 105H. This course analyzes, from a historical perspective, two core problems in Latin America's modern (since c. 1880) history: political authoritarianism and economic underdevelopment. The temporal and spatial dimensions of change will be highlighted in discussions of patron-client political systems, military autonomy and impunity, social movements and revolution, export-oriented economic growth, industrialization, and the roles of national, ethnic and gender identities.

HIST 475/575. History of Modern Africa. Lecture 3 hours; 3 credits. Prerequisite: HIST 101H, 102H, 103H, 104H or 105H. The course is designed to enrich students' understanding of the intersections of political, economic, social and cultural forces that shaped Africa in the last 150 years and continue to affect the lives of peoples throughout the continent. It will focus on a series of major historical transitions that have shaped the development of modern Africa, including the end of the Atlantic slave trade, European imperial conquest and colonial rule, African resistance to European rule, social and cultural transformations, the end of colonial rule and post-colonial challenges.

HIST 495/595, 496/596. Topics in History. 1-3 credits each semester. Prerequisite: HIST 101H, 102H, 103H, 104H or 105H. Advanced study of selected topics designed for small groups of qualified students to work on subjects of mutual interest which may not be offered regularly. These courses appear in the course schedule, and will be more fully described in information distributed to academic advisors.

HIST 497/597, 498/598. Tutorial Work in Special Topics in History. 3 credits each semester. Prerequisites: senior standing and approval of the department chair. Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

HIST 600. Historical Theory and Practice. Lecture 3 hours; 3 credits. Analysis of the development of historical theories, principles and methods and their application to historical research and writing. Required of all graduate students in history.

HIST 602. Studies in American Colonial and Revolutionary History. Seminar; 3 credits.

HIST 604. Studies in American History, 1787-1877. Seminar; 3 credits.

HIST 606. Studies in American History, 1877-1933. Seminar; 3 credits.

HIST 608. Studies in American History, 1933 to the Present. Seminar; 3 credits.

HIST 612. Studies in the History of the South. Seminar; 3 credits.

HIST 616. Studies in American Diplomatic History. Seminar; 3 credits.

HIST 618. Studies in American Social History. Seminar; 3 credits.

HIST 622. The Atlantic Slave Trade. Lecture 3 hours; 3 credits. The course will explore the trans-Atlantic slave trade from its beginnings in the 15th century to its suppression in the 19th century. It will examine the vast body of historical literature on Africa, the Atlantic slave trade and the New World. The course will provide students with a general orientation to the broad context of the Atlantic slave trade. Locating the trade in the context of the expansion of capitalist Europe, students will examine the economic and cultural forces, as well as personal experiences of slavery from Africa, across the Atlantic Ocean, to the Americas. The course will also look at how the trade transformed Africa and how Africa and Africans in turn transformed the Atlantic World.

HIST 625. Studies in African-American History. Seminar; 3 credits.

HIST 633. Studies in International History. Seminar; 3 credits.

HIST 634. Studies in the History of Military Affairs. Seminar; 3 credits.

HIST 637. Studies in War and the Humanities. Lecture 3 hours; 3 credits. The impact of war on society, literature and the arts.

HIST 640. Studies in East Asian History. Seminar; 3 credits.

HIST 645. Studies in Latin American History. Seminar; 3 credits.

HIST 646. Studies in Russian History. Lecture 3 hours; 3 credits. Research in Soviet archives in the past decade has enriched and enlarged the study of Stalin's era (1924-1953). This reading seminar samples new literature on traditional topics, such as Stalin's rise to power, methods of rule, and foreign policies, as well as scholarship in newly emerging fields. These areas include social history, gender and the family, cinema and popular culture, nationalities, patron-client relations, and the history of science.

HIST 647. Studies in New Maritime History. Lecture 3 hours; 3 credits. The seminar will explore the major recent developments in American maritime historiography. The course will explore how maritime history both presents unique understandings of human history while also working within or redefining broader historiographical constructs. Each student must learn to recognize and analyze historical interpretation and develop, write, and present their own interpretations of primary sources related to a specific topic of local maritime history.

HIST 650. Studies in Ancient History. Seminar; 3 credits.

HIST 652. Studies in Medieval History. Seminar; 3 credits.

HIST 654. Studies in European History, 1350-1600. Seminar; 3 credits.

HIST 656. Studies in European History, 1600-1815. Seminar; 3 credits.

HIST 658. Studies in European History, 1815-1914. Seminar; 3 credits.

HIST 660. Studies in European History, 1914 to the Present. Seminar; 3 credits.

HIST 668. Internships in History. Seminar; 3 credits. Minimum of 120 hours. Student works with professionals in areas such as museum management, archives administration, historical editing, historical preservation, electronic records management, archaeology, or oral history. Students will be supervised by a graduate faculty member, who will assign academic reading and written work, such as an historiographic essay, research paper, or final project. Individually arranged.

HIST 675. M.A. Exam Preparation and Research. Lecture 3 hours; 3 credits. Prerequisite: permission of the graduate program director. This advanced seminar integrates the skills needed to pass the M.A. exam in history. Exercises include designing examination reading lists, learning the historiography of the exam fields, preparing for orals, and writing and evaluating a practice exam. This course is not open to students pursuing the thesis option.

HIST 695, 696. Topics in History. 1-3 credits.

HIST 697. Tutorials in History. 1-3 credits. Individually arranged with appropriate professor and with the permission of the graduate program director.

HIST 698* Thesis. 3 credits.

HIST 699* Thesis. 3 – 9 credits.

HIST 718. Mao's China. Lecture 3 hours; 3 credits. This reading seminar will focus on the changes of the Chinese society since the beginning of the 20th century. It will examine the pivotal historical events that led to the Chinese revolution, which put Mao's Communist regime in power and has changed Chinese society ever since. While studying the history chronologically, students will identify issues and factors that affect the Chinese political system and society, and examine the legacies of Mao's revolution from social and individual perspectives. The course will also focus on political formation and transformation of the government, social structure and upheavals, economic reforms, and foreign policies. (cross listed with IS 718/818)

HIST 755. Conflict and Violence in Modern Africa. Lecture 3 hours; 3 credits. This course will confront the theme of conflict and violence in Africa since the mid-20th century. It will explore the reasons behind the level of violent conflicts in the continent today, seek to understand their larger significance, and explore ideas for conflict

resolution and prevention. (cross listed with IS 755/855)

HIST 795. Selected Topics in International Studies. 3 credits. The advanced historical study of selected topics in international studies.

Humanities — HUM

HUM 595. Topics in Humanities. 1-3 credits. Advanced study of selected topics designed for small groups of qualified students to work on subjects of mutual interest which may not be offered regularly. These courses will appear in the course schedule and will be more fully described in information distributed to academic advisors.

HUM 597. Tutorial Work in Humanities. 1-3 credits. Independent reading and study on a topic selected under the direction of an instructor.

HUM 601. The Subject of the Humanities: Introduction to Research, Methodology, and Critical Theory. Lecture 3 hours; 3 credits. An introduction to the basic elements of humanities research, methodology, and critical approaches. The course will expand students' research skills, provide a survey of current methodological approaches, and consider fundamental theoretical questions.

HUM 602. The Humanities on Trial: Postmodernity, Technology, Globalization. Lecture 3 hours; 3 credits. Readings and discussion will focus on the transformation of the humanities in the age of postmodernity, postnationalism, and technology. In addition, the further development of strong research and critical thinking skills will be emphasized.

HUM 630. The Information Society. Lecture 3 hours; 3 credits. This course explores the theories, questions, claims and myths that have accompanied the rise of new communication technologies and electronically derived digital information that define the "Electronic Revolution," also known as the Information Society. (cross-listed with COMM 630)

HUM 640. Television and Politics. Lecture 3 hours; 3 credits. This class closely examines television's role in shaping and reflecting contemporary American political culture, the conduct of foreign policy, and formal political processes, such as elections. (cross-listed with COMM 640)

HUM 657. Introduction to American Popular Culture. Lecture 3 hours; 3 credits. This course introduces students to the history and diversity of popular culture forms, industries, criticism, and debates in the United States. The course is interdisciplinary, with a focus on the relationship of cultural hierarchy to social and national identity.

HUM 668. Internship. 3 credits. This course allows graduate students in Humanities to pursue a structured work experience in a field relevant to a student's course of study. Student will work with a supervisor at the work site and a faculty advisor in Humanities. Requirements include a formal essay connected to the experience, portfolio, and satisfactory evaluation by the supervisor. Permission of Humanities director required. Pass/fail grading only.

HUM 694. Interdisciplinarity and the Humanities: Theory and Practice. Lecture/seminar 3 hours; 3 credits. Prerequisites: HUM 601, 602. The capstone seminar for non-thesis humanities students. The seminar provides a forum in which to discuss contemporary theories and questions concerning interdisciplinary humanities research. Students will also develop

and complete a research paper which reflects their own interdisciplinary programs of study.

HUM 696. Special Topics in Humanities. 1-3 credits. Prerequisite: permission of the instructor. Appropriate advanced study of small groups on special topics selected under the direction of an instructor. Conferences and papers as appropriate.

HUM 697. Tutorial Work in Humanities. 1-3 credits. Prerequisite: permission of the instructor. Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

HUM 698. Thesis. 3 credits. Prerequisites: HUM 601 and 602.

HUM 699. Thesis. 3 or 6 credits. Course requirement for thesis option.

HUM 797/897. Tutorial Work in the Humanities. 1-3 credits. Independent reading and study under the direction of an instructor on a topic to be selected.

International Studies — IS

Nondegree students must obtain the approval of the director prior to enrolling in GPIS classes

IS 600. Research Methods in International Studies. Lecture 3 hours; 3 credits. Interdisciplinary quantitative techniques applicable to the study of international phenomena.

IS 601. Seminar in International Relations Theory. Lecture 3 hours; 3 credits. Surveys major theoretical approaches to international relations and foreign policy. A systematic introduction designed to lay a foundation for advanced graduate study.

IS 620. Advanced Statistical Techniques for International Studies. Lecture 3 hours; 3 credits. Prerequisite: IS 600. Multivariate regression, causal analysis, and advanced statistical applications.

IS 655. International History. Lecture 3 hours. Course explores how different societies in the 20th century were shaped by similar practices, ideas, and pressures. Course themes may include colonialism, the global history of world war II, the cold war ethnic distortion and the consumer revolution among others.

IS 668. Internship in International Studies. 3 credits. Prerequisite: approval of the director. Individually arranged internship at local, state, national or international level.

IS 695. Topics in International Studies. Lecture 3 hours; 3 credits. The advanced study of selected (titled) topics not offered on a regular basis.

IS 696. Seminar Topics in International Studies. 3 credits. The advanced study of selected topics in an interdisciplinary manner which permits small groups of qualified students to work on subjects of mutual interest. Due to their specialized nature, seminar topics may not be offered regularly.

IS 697. Independent Research in International Studies. 3 credits. Independent research on a topic from an interdisciplinary perspective. Students must receive prior approval from the faculty supervisor and the director. May be repeated up to six credits.

IS 698. Directed Research. 3 credits. Prerequisite: approval of director or instructor. Methodological and theoretical preparation designed to assist students in writing a thesis.

IS 699. Thesis. 1-9 credits. Writing of the thesis.

IS 701/801. Global Change and American Foreign Policy. Seminar 3 hours; 3 credits. This research seminar examines the transformation of

the U.S. role in the world in the global context of the 20th century.

IS 702/802. Approaches to Collective Security. Lecture 3 hours; 3 credits. This seminar explores the origins of the idea of collective security, examines the attempts to organize international security collectively and assesses possibilities and opportunities for collective security arrangements after the Cold War.

IS 703/803. Ethics and International Relations. Lecture 3 hours; 3 credits. The focus of this research seminar will be on the role of normative ideas in international relations. Students will be introduced to the growing literature on normative approaches to international relations as well as the traditional literature on the practical and philosophical problems of ethical action in the relations of states. Although a number of policy applications will be considered, the primary focus will be on the theoretical incorporation of normative ideas into our understanding of state action in the anarchic international environment.

IS 704/804. Latin American Politics. Seminar 3 hours; 3 credits. This course examines Latin American politics from comparative and historical perspectives. Particular focus is placed on various manifestations of political authority in the region and the major societal challenges to state power. The course reviews and critiques alternative theoretical approaches to the study of state-societal relations in Latin America.

IS 705/805. The Euro-Atlantic Community. Seminar 3 hours; 3 credits. An examination of the Euro-Atlantic area as a partial international system since World War II; alignments and patterns within and between the members of the European "community" and the role and attitudes of the United States and leading European states to preserve and strengthen their sovereign prerogatives and influence; and the prospects for a true Euro-Atlantic community that would link the U.S. and Europe.

IS 706/806. The Causes of War. Lecture 3 hours; 3 credits. This research seminar will explore the theoretical and empirical literature on the causes of violent conflict between states.

IS 707/807. Interdependence, Power, and Transnationalism. Seminar 3 hours; 3 credits. This course covers the fundamental concepts, ideas, and approaches to the study of interdependence and transnationalism. It seeks to expose students to the nature, role, and impact of economic, technological, strategic, and cultural interdependence. Cases of interdependence and transnationalism are explored in the post-Cold War era. Some focus is placed on how interdependence and transnationalism are impacting the power of the state.

IS 709/809. Chinese Foreign Policy. Seminar 3 hours; 3 credits. This seminar includes an advanced survey of theoretical approaches to the study of Chinese foreign policy and in-depth analyses of the domestic/international environment, ideological principles, political/economic goals, military/diplomatic instruments, decision-making processes, and global/regional consequences of Chinese foreign policy.

IS 710/810. Global Environmental Policy. Lecture 3 hours; 3 credits. This seminar examines the institutions and political actors involved in global environmental policy making with emphasis on the role of the United States. In doing so, it addresses the scientific and political debate concerning the causes, consequences, and proposed solutions of selected worldwide ecological problems, including global climate change,

stratospheric ozone depletion, acid rain, and loss of biodiversity among others.

IS 711/811. International Migration and Refugee Movement. Seminar 3 hours; 3 credits. A review of current literature and empirical issues concerning transnational migration and refugees.

IS 712/812. The New Germany in the New Europe. Seminar 3 hours; 3 credits. The unification of Germany and the end of the East-West conflict have changed the context within which policy is made in Europe. What kind of Europe will emerge? What kind of hierarchies will determine direction and pace of European politics? The purpose of this course is to explore the role played by Germany in the development of post-Cold War European politics.

IS 713/813. Global Political Economy. Seminar 3 hours; 3 credits. Analysis of the forces shaping national and transnational economic institutions and their policies on a range of contemporary issues, including North-South relations.

IS 714/814. Law in the International System. Lecture 3 hours; 3 credits. An introduction to the principles of international law and to the political and institutional role of law in the relations of states.

IS 715/815. The New France in the New Europe. Seminar 3 hours; 3 credits. Emphasis will be placed on the transformation of France--the state and its people--since the end of World War II; the global conditions that shaped French policies in and toward Europe during the Cold War; and the role played by France in the transformation of Europe into a union of states.

IS 716/816. Theories of Comparative Sociopolitical Studies. Lecture 3 hours; 3 credits. The fundamental goal of the course is to provide the theoretical basis for subsequent coursework and research in the comparative and regional studies track. To achieve this goal, this seminar examines major theories and debates in comparative social and political studies based on extensive and intensive literature review.

IS 717/817. World Population and Development. Seminar 3 hours; 3 credits. This seminar discusses population processes and their connections to socioeconomic development. A nontechnical course, the goal is to introduce students to the major concerns and issues in population and current debates over the role of population in sustainable development. It will provide students with a systematic but critical review of research findings and issues in various areas of population and development.

IS 718/818. Mao's China. Lecture 3 hours; 3 credits. This reading seminar will focus on the changes of the Chinese society since the beginning of the 20th century. It will examine the pivotal historical events that led to the Chinese revolution, which put Mao's Communist regime in power and has changed the Chinese society ever since. While studying the history chronologically, students will identify issues and factors that affect the Chinese political system and society, and examine the legacies of Mao's revolution from social and individual perspectives. The course will also focus on political formation and transformation of the government, social structure and upheavals, economic reforms, and foreign policies. (cross listed with HIST 718)

IS 719/819. Chinese Politics. Lecture 3 hours; 3 credits. This seminar focuses on post-Mao China. It examines the fundamental rules, prominent players, and major issues in contemporary Chinese politics. The course reviews and critiques

alternative theoretical approaches to the study of Chinese politics.

IS 720/820. Research Seminar in Global Security. Seminar 3 hours; 3 credits. The research seminar investigates the profound changes in international security brought about by the end of the Cold War with a specific focus on the role of nuclear weapons. The primary purpose of the seminar is to promote research into the global aspects of the nuclear issue and to enhance understanding of the relationship between nuclear control and the New World Order.

IS 721/821. New World Order: Chaos and Coherence. Seminar 3 hours; 3 credits. The end of the Cold War has ushered tremendous political changes and an equally broad intellectual debate on the meaning of these changes. What will be the basic rules of international politics? Will the future resemble the past or follow new rules of its own? What countries, what groups, and what issues will dominate the future of world politics?

IS 722/822. Democracy and International Relations. Lecture 3 hours; 3 credits. An examination of the relationship between democratic politics, democratic ideals, and international relations. Subjects covered will include trends and processes of democratization and their implications for international relations, the distinctiveness of democratic states in their international behavior, the impact of the international environment on the internal politics of democratic states, and the problems of democracy in global governance.

IS 723/823. American Foreign Policy and World Order. Lecture 3 hours. This course deals with the adaptation of US Foreign policy to the changing conditions of the cold war.

IS 725/825. Politics of the Middle East. Lecture 3 hours; 3 credits. Explores the international relations of the Middle East from World War I to the present. Examines the origins of the Arab-Israeli and Persian Gulf Wars and their modern dimensions. Examines the role of oil, outside powers and religion.

IS 730/830. The Rise and Fall of the Socialist Bloc. Lecture 3 hours; 3 credits. This reading seminar will feature occasional lectures and extensive discussion about topics such as the consolidation of Soviet power in East Europe, the road to the Cold War, socialist economic practices, Soviet "imperialism" within the bloc, Soviet support for "national-liberation" movements in Asia and Africa, the building of the wall, the Sino-Soviet alliance, the events of 1989, and post-socialist nostalgia.

IS 740/840. Political Economy of Development. Seminar 3 hours; 3 credits. Prerequisite: IS 600. The 1980s and early 1990s have witnessed considerable change especially in the Second and Third World countries. Among such changes are marketization, democratization, ethnic conflicts, regionalism, and growing protectionism. This course aims to examine these developments and their implications to the global division of labor and development process of developing countries.

IS 741/841. Globalization and Social Change in the World System. Seminar 3 hours; 3 credits. This course is intended to first identify the distinguishing characteristics of globalization. It then attempts to examine its implications on a number of critical issues, including the future of democracy, income distribution and ethnic, class, and gender relations.

IS 742/842. Contested Territories. Lecture 3 hours; 3 credits. Using case studies of Europe

since 1918, this course examines the contours of territorial disputes. The ways in which territorial contests are presented and represented through the lenses of geopolitics, ethnicity and race, nationalism, gender, violence, international authority and diplomatic and institutional influence will be explored.

IS 745/845. Social Movements and Revolution in Latin American History. Lecture 3 hours; 3 credits. Interpretations of the three major social revolutions in modern Latin America (Mexico 1910, Cuba 1959 and Nicaragua 1979) and of a variety of social movements (agrarian, labor, urban, religious and so on) are studied from a continental perspective. The relevant theoretical literature and the economic, cultural and political background receive special attention. A broad knowledge of modern Latin American history is assumed.

IS 751/851. Ethnic Conflict in the Emerging Global Order. Lecture 3 hours; 3 credits. Using different case studies, this course investigates the most important internal and external factors that cause ethnic conflicts. It also examines different mechanisms that help resolve or mitigate such conflicts.

IS 752/852. Research Seminar in International Studies: Refugees. Seminar 3 hours; 3 credits. This is a graduate-level seminar focusing on the refugee movement from a global perspective. The goals are to provide a critical and realistic understanding of the refugee phenomenon and to explain why the refugees tend to follow some identifiable paths, and why they sometimes return and sometimes do not. Discussion will be centered on the causes and consequences of refugee flow, and the roles the more developed countries can play in helping solve the problem.

IS 755/855. Conflict and Violence in Modern Africa. Lecture 3 hours; 3 credits. This course will confront the theme of conflict and violence in Africa since the mid-20th century. It will explore the reasons behind the level of violent conflicts in the continent today, seek to understand their larger significance, and explore ideas for conflict resolution and prevention. (cross listed with HIST 755)

IS 760/860. International Cultural Studies: History, Theory and Application. Lecture 3 hours; 3 credits. Course analyzes culture in the context of material conditions in which it is produced, disseminated, controlled and practiced. Theoretical application of cultural studies will include developing familiarity with key foundational theories, terminologies, and critical thinking.

IS 794/894. Seminar in Thesis and Dissertation Preparation. 3 credits. Prerequisite: permission of the director. Prepares students to research, formulate and write thesis and dissertation prospectuses.

IS 795/895. Topics in International Studies. 3 credits. The advanced study and discussion of selected (titled) topics not offered on a regular basis.

IS 796/896. Selected Topics in International Studies. 3 credits. The advanced study of selected topics in an interdisciplinary manner which will permit small groups of qualified students to work on subjects of mutual interest. Due to their specialized nature, the course may not be offered regularly.

IS 868. Internship in International Studies. 3 credits. Prerequisite: approval of director. Internship individually arranged at local, state, or international level.

IS 897. Independent Research in International Studies. 3 credits. Prerequisite: approval of the director. Independent research directed by professors.

IS 898. Directed Research. 3 credits. Prerequisite: approval of director or instructor. Methodological and theoretical preparation designed to assist students in writing a dissertation.

IS 899. Dissertation. 1-9 credits. May be repeated up to 18 credits.

IS 999. International Studies 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Other curriculum-relevant courses are regularly offered by other departments. For information, consult with the graduate program director.

Music — MUSC

MUSC 410/510. Psychology of Music. Lecture 3 hours; 3 credits. Prerequisite: junior standing or permission of instructor. This course is designed to assist students in enhancing their understanding of the aesthetic response to music in various settings. Students will learn to integrate their understanding of musical aptitude as it relates to human growth and development. In addition, students will study the psychological implication of personality types as they develop, implement, and assess their pedagogical approach.

MUSC 422/522. Form and Analysis. Lecture 2 hours; aural analysis 1 hour; 2 credits. Prerequisites: MUSC 322 and 324 or permission of the instructor. Study and analysis of the principal traditional musical forms. Stylistic and harmonic analysis as it related to score study will be discussed. (offered spring, odd years)

MUSC 428/528. Music Theory Review. Lecture 3 hours; 3 credits. Prerequisite: junior standing and/or permission of the instructor. A review of basic music theory with more advanced work in music analysis. The course is primarily for students in the M.S. in Education degree program. This course is required for those students who do not pass the Theory Placement Test. No credit for this course may be applied toward the degree.

MUSC 445/545. Applied Music Pedagogy. One hour seminar; 1 hour laboratory; 1 credit each semester. Prerequisite: music major senior standing or permission of the department. Teaching techniques, literature in the performing area. Seminar deals with resource materials. Laboratory: observation and teaching under supervision.

MUSC 446/546. Applied Music Literature. One hour seminar; 1 hour laboratory; 1 credit each semester. Prerequisite: music major senior standing or permission of the department. Teaching techniques, literature in the performing area. Seminar deals with resource materials. Laboratory: observation and teaching under supervision.

MUSC 460/560. History of Jazz. Lecture 3 hours; 3 credits. Prerequisite: junior standing. This course will study the historical development of jazz as an American art form. The emotion and meaning of this style will be investigated as well as the historical and contemporary aesthetic response. Emphasis will include the defining role of African American artists. The influence of jazz on the

development of contemporary American music will be discussed. Written critiques of live performances and a research paper will be required.

MUSC 466/566. Modern Music. Lecture 3 hours; 3 credits. Prerequisites: MUSC 361W and 362 or permission of the instructor. A study of the techniques and styles in music in the twentieth and twenty first century. (offered spring, odd years)

MUSC 491/591. Music in the Baroque Era. Lecture 3 hours; 3 credits. Prerequisites: MUSC 361W-362. A study of music history from monody through the works of Bach and Handel. A discussion of musical style within the context of cultural history.

MUSC 492/592. Music in the Classical Era. Lecture 3 hours; 3 credits. Prerequisites: MUSC 361W-362. A study of music history from the Rococo Period through the works of Haydn, Mozart and Beethoven. A discussion of musical style within the context of cultural history.

MUSC 494/594. Music in the Romantic Era. Lecture 3 hours; 3 credits. Prerequisites: MUSC 361W-362. A study of music history from the late works of Beethoven to Mahler and Strauss. A discussion of musical style within the context of cultural history.

MUSC 495/595, 496/596. Topics in Music. 1-3 credits each semester. Prerequisite: junior standing or permission of the instructor. These courses will appear in the course schedule. Course descriptions and prerequisites for each course may be found in information distributed to all academic advisors.

MUSC 601. Advanced Theory Survey. Lecture 3 hours; 3 credits. Prerequisite: Baccalaureate degree in music or permission of the department chair and instructor. A review of melodic, harmonic, and contrapuntal elements of music through analysis and writing. The course will cover techniques of the eighteenth and nineteenth centuries, with only a brief survey of twentieth-century techniques.

MUSC 602. Analytical Techniques. Lecture 3 hours; 3 credits. Prerequisite: Baccalaureate degree in music or permission of department chair and instructor. Examines techniques and concepts applied to compositions of the eighteenth, nineteenth and twentieth centuries through analysis of contrapuntal and harmonic textures, form and performance practice.

MUSC 603. Principles of Music Education. Lecture 3 hours; 3 credits. Prerequisite: Baccalaureate degree in music or permission of the department chair and instructor. Methods, techniques, principles, and tools of music education, with reference to various types of school situations.

MUSC 604. Foundations of Music Education. Lecture 3 hours; 3 credits. Prerequisite: Baccalaureate degree in music or permission of the department chair and instructor. This course involves the study of the philosophical, psychological and historical foundations of music related to curriculum development.

MUSC 605. Literature of the Wind Ensemble. Lecture 3 hours; 3 credits. Prerequisite: Baccalaureate degree in music or permission of the instructor. The course centers upon the study of the performance, review and analysis of symphonic band music. Suited especially to the needs of directors of secondary school and other nonprofessional wind ensembles.

MUSC 606. Choral Music Literature. Lecture 3 hours; 3 credits. Prerequisite: Baccalaureate degree in music or permission of the

department chair and instructor. Survey of choral literature and practical performance practices from the Renaissance to the present.

MUSC 607. Orff Schulwerk Level I. Lecture 3 hours; 3 credits. Prerequisite: undergraduate degree in music or music education. This course is a study of basic Orff Schulwerk techniques. Level I pedagogy includes instruction in the use of pentatonic scale, ostinato, elemental forms, improvisation, basic body movement and basic soprano recorder skills.

MUSC 608. Orff Schulwerk Level II. Lecture 3 hours; 3 credits. Prerequisite: MUSC 607 and proficiency on the soprano recorder. Introduction of Alto recorder occurs in Level II. Also included is an in-depth study of Orff Schulwerk Vol. III in which the student will be instructed in the use of I, IV, V harmony. Body movement and extensive study of folk dance are included.

MUSC 609. Literature of the Orchestra. Lecture 3 hours; 3 credits. Prerequisite: MUSA 605 and 606. This course reviews repertoire selection criteria for elementary through high school, score analysis, and historical development of the orchestra. Suited especially for public school orchestra teachers.

MUSC 610. Orff Schulwerk Level III. Lecture 3 hours; 3 credits. Prerequisites: MUSC 607 and 608. This course will build upon the skills and concepts introduced in Orff Schulwerk Levels I and II. Recorder technique will be expanded upon as well as eurhythmics and special topics.

MUSC 611. Current Trends in Elementary and Secondary Music. Lecture 3 hours; 3 credits. Prerequisite: Baccalaureate degree in music or permission of the department chair and instructor. Designed for public school music teachers. This course involves the study of current methodology, its practice and uses in the elementary and secondary general/vocal/instrumental music program.

MUSC 612. Organization and Administration of Instrumental Music. Lecture 3 hours; 3 credits. Prerequisite: Baccalaureate degree in music or permission of instructor. The course involves the study of effective organization and implementation techniques for elementary and secondary instrumental ensembles; includes particular problems in the administration of high school instrumental groups.

MUSC 613. Workshop in Music Education. Lecture 1 hour; 1 credit. Prerequisite: Baccalaureate degree in music or permission of the department chair and instructor. This course centers upon the development of performance and instructional skills in various aspects of music education. May be repeated twice with different emphases.

MUSC 614. Workshop in Instrumental Music. Lecture 1 hour; 1 credit. Prerequisite: Baccalaureate degree in music or permission of the department chair and instructor. The course centers upon the development of performance and instrumental skills in various aspects of instrumental music. May be repeated twice with different emphases.

MUSC 615. Workshop in Choral Music. Lecture 1 hour; 1 credit. Prerequisite: Baccalaureate degree in music or permission of the department chair and instructor. This course centers upon the development of conducting techniques, performance and instructional skills in various aspects of choral music. May be repeated twice with different emphases.

MUSC 616. Advanced Conducting Seminar. Lecture 3 hours; 3 credits. Prerequisite: Baccalaureate degree in music or permission of instructor or department chair. Involves conducting techniques as applied to various mixed ensembles. Emphasizes the technical considerations common to all phases of choral and instrumental conducting with special concern for school problems.

MUSC 623. Arranging for Instrumental Ensembles. Lecture 3 hours; 3 credits. Prerequisite: passing the graduate theory placement test. A course focused upon the arranging of music for instrumental ensembles from trio, quartet, quintet, etc., to full band or orchestra. Techniques will be discussed in class and students will complete written assignments to implement these techniques. Final paper will be an arrangement for an ensemble of at least six parts.

MUSC 600. Introduction to Research in Music Education. Lecture 1 hour; 1 credit. Corequisite: MUSC 630. This course should be taken among the first courses in the M.M.E. Program. Introduces graduate students to basic skills in Music Education research, including bibliographic searches, on-line searches, computer data analysis, and conventions of scholarly writing for reporting findings.

MUSC 630. Research in Music Education. Lecture 3 hours; 3 credits. Prerequisite: ECI 600. Types of research, selection of problems, location of educational information, collection and classification of data, organization, presentation and interpretation of materials in the area of music education.

MUSC 635. The Use of Computers and Midi Technology in the Classroom. Lecture 3 hours; 3 credits. An in-depth survey of software available for use in the classroom, including sequencing, notation, and theoretical applications. A basic understanding of synthesizers and MIDI technology will be emphasized. The course will focus upon a hands-on approach to the subject matter, and extensive laboratory time in the EMS will be required.

MUSC 636. Techniques of Jazz Education in the Secondary School. Lecture 3 hours; 3 credits. This course will deal with rehearsal techniques for the Jazz Ensemble, including articulation, style, phrasing, literature, and improvisational techniques. In addition, Jazz history and literature will be discussed in detail.

MUSC 639. Vocal/Choral Arranging. Lecture 3 hours; 3 credits. Prerequisite: passing the Theory Placement Test. Course is designed to develop the skills necessary to arrange a piece of vocal music for ensembles of various sizes and makeup. Techniques will be discussed and shown in class and students will complete written assignments to implement these techniques.

MUSC 680. Performing Ensembles. 1 credit. Prerequisite: permission of the instructor. Students may enroll in any of the departmental ensembles with the permission of the ensemble director. Students registered for graduate credit are expected to help with sectional rehearsals and do in-depth score study on all music being performed.

MUSC 691. Tests and Measurements in Music Education. Lecture 3 hours; 3 credits. Prerequisite: Baccalaureate degree in music or permission of the department chair and instructor. This course is designed to acquaint the student with tests and measurements used in the field of music education and the methods of designing and utilizing such tests.

MUSC 695, 696. Topics in Music. 1-3 credits each semester. These courses will appear in the course schedule. Course descriptions and prerequisites for each course may be found in information distributed to all academic advisors.

MUSC 697. Independent Study. 1-3 credits. Prerequisite: permission of the graduate program director. Designed for individualized study. Independent study projects will be related to music education and done under the supervision of a certified faculty member.

MUSC 698. Thesis Research. 3 credits. Prerequisite: MUSC 630 and/or permission of the instructor. Application of research procedures in music education, culminating in student study of selected topics.

MUSC 699. Thesis. 3 credits. Prerequisite: MUSC 698.

Applied Music Instruction* — MUSA

All students wishing to register for applied music must have a placement audition prior to registration. Music Department requirements are described in detail in the section entitled "College of Arts and Letters Degree Requirements." Students studying applied music for credit will perform before an examining committee at the end of each semester following their first semester of study at this institution.

Ap. Mus. 651-652. One hour lesson per week; 3 graduate credits each semester. Prerequisites: MUSC 452 or equivalent and permission of faculty. Numbers may be repeated. Completion of this level includes successful performance of a one-hour public recital.

Philosophy — PHIL

PHIL 404/504. Twentieth Century Continental Philosophy. Lecture 3 hours; 3 credits. Prerequisites: junior standing and three semester hours in philosophy, or permission of the instructor. A study of influential contemporary movements in European philosophy. Emphasis will be given to the writings of Husserl, Heidegger, Sartre, Gadamer, Derrida, and Foucault.

PHIL 406/506. Contemporary Analytic Philosophy. Lecture 3 hours; 3 credits. Prerequisites: junior standing and three semester hours in philosophy, or permission of the instructor. A study of the twentieth-century analytic tradition, including such thinkers as Moore, Russell, Wittgenstein, Ayer, Carnap, Ryle, Wisdom, and Austin.

PHIL 410/510. Social and Political Philosophy. Lecture 3 hours; 3 credits. Prerequisites: junior standing and three semester hours in philosophy, or permission of the instructor. A philosophical analysis of the relation between man, society, and the state, studying about a dozen philosophers since Plato on such topics as justice, authority, law, freedom, and civil rights.

PHIL 411/511. Postmodernism and Political Philosophy. Lecture 3 hours; 3 credits. Prerequisites: three semester hours in philosophy and junior standing or permission of the instructor.

*Designated for activity credit.

* For these courses the student is charged the applied music fee of \$175 for one-credit courses and \$250 for two- or three-credit courses. Individual instruction in applied music is offered in guitar, harpsichord, piano, organ, voice, and the orchestral instruments. For information concerning fees for applied music, refer to the section entitled "Fees and Expenses." Students in applied music are assigned to teachers by the department chair.

An examination of intellectual currents in postmodernism as they pertain to central questions in social and political thought. The course covers the roots of modernism in the Enlightenment and various challenges to modernism in 19th and 20th century thought. Particular attention is given to the prospects for democracy in postmodern thinking.

PHIL 412/512. Philosophy of Law. Lecture 3 hours; 3 credits. Prerequisite: junior standing and three semester hours in philosophy, or permission of the instructor. An examination of the nature of law and philosophical issues concerning the law.

PHIL 417/517. Philosophy and Educational Issues. Lecture 3 hours; 3 credits. Prerequisites: junior standing and one introductory philosophy course or a course in Principles of Education. Considers the relationship of philosophy and education. Topics considered include: philosophy as a foundation for education, education as an institution, and educational and philosophical issues as they relate to each other.

PHIL 427/527. Myth and Philosophy. Lecture 3 hours; 3 credits. Prerequisites: junior standing and three semester hours in philosophy, or permission of the instructor. A study of the nature of myth, its role and importance in human thought. The analysis will stress the relationships between mythology, religion, literature, drama, and philosophy in ancient Greece.

PHIL 431/531. Nineteenth Century Philosophy. Lecture 3 hours; 3 credits. Prerequisites: junior standing and three semester hours in philosophy, or permission of the instructor. A study of significant intellectual innovations and revolutions in nineteenth century European thought that helped shape the modern mind. Emphasis will be given to the writings of Kant, Schopenhauer, Hegel, Marx, Kierkegaard and Nietzsche.

PHIL 440/540. Philosophy of Natural Sciences. Lecture 3 hours; 3 credits. Prerequisites: junior standing, three semester hours in philosophy and eight semester hours of laboratory science. A study of the concepts and philosophical problems common to the natural sciences: scientific reasoning, confirmation, explanation, laws, meaning, theories, revolutions, progress, and values.

PHIL 441/541. Foundations of Ethics. Lecture 3 hours; 3 credits. Prerequisites: junior standing and three semester hours in philosophy, or permission of the instructor. An inquiry into the philosophical foundations of ethical theory. Various ethical systems are considered.

PHIL 442/542. Studies in Applied Ethics. Lecture 3 hours; 3 credits. Prerequisites: junior standing and three semester hours in philosophy, or permission of the instructor. An intensive examination of ethical issues in a particular field or profession; an emphasis on ethical theory underlying practical decisions.

PHIL 480/580. Hinduism. Lecture 3 hours; 3 credits. Prerequisites: junior standing and three semester hours in philosophy, or permission of the instructor. An intensive study of the basic teachings of Hinduism as manifested in its sacred writings.

PHIL 481/581. Buddhism. Lecture 3 hours; 3 credits. Prerequisites: junior standing and three semester hours in philosophy, or permission of the instructor. A study of the origin, historical development, and contemporary status of Buddhism, in terms of its religious and philosophical elements and its influence in Asian cultures.

PHIL 482/582. Chinese Religion and Philosophy. Lecture 3 hours; 3 credits. Prerequisites: junior standing and three semester hours in philosophy, or permission of the instructor. A study of Chinese thought emphasizing Early and Classical Confucianism and Taoism, Chinese Buddhism, and NeoConfucianism. Modern currents of Chinese thought will also be discussed.

PHIL 485/585. Japanese Religion and Philosophy. Lecture 3 hours; 3 credits. Prerequisites: junior standing and three semester hours in philosophy or permission of the instructor. A study of the religious and philosophical traditions of Japan. Emphasis will be given to Shintoism, Buddhism, and Neo-Confucianism and their contemporary status and influence in Japanese culture.

PHIL 491/591, 492/592, 493/593, 494/594. Seminar in Philosophy. 3 credits each semester. Prerequisites: junior standing and six semester hours in philosophy, or permission of the instructor. Intensive examination of the thought of one major philosopher.

PHIL 495/595, 496/596. Topics in Philosophy. 1-3 credits each semester. Prerequisite: appropriate survey course or permission of the instructor. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule, and will be more fully described in information distributed to all academic advisors.

PHIL 497/597, 498/598. Tutorial Work in Special Topics in Philosophy. 1-3 credits each semester. Prerequisites: senior standing and approval of the department chair. Independent reading and study of a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

PHIL 603. Studies in Social and Political Philosophy. Lecture 3 hours; 3 credits. Prerequisite: One 400/500-level Philosophy course with a grade of "B" or higher (or equivalent). An intensive study of one or more figures, movements, or theoretical questions in social and political philosophy.

PHIL 606. Studies in Asian Philosophy. Lecture 3 hours; 3 credits. An intensive study of one concept, movement, or thinker indigenous to the Asian philosophical tradition.

PHIL 608. Studies in Ancient Philosophy. Lecture 3 hours; 3 credits. Prerequisite: One 400/500-level Philosophy course with a grade of "B" or higher (or equivalent). A study of certain philosophers, movements or specific philosophical issues in the ancient Greek and early Roman periods.

PHIL 609. Studies in the Philosophy of Science. Lecture 3 hours; 3 credits. Prerequisite: One 400/500-level Philosophy course with a grade of "B" or higher (or equivalent). A consideration of some philosophical problem or problem area related to science or to some position or tradition in the philosophy of science.

PHIL 610. Studies in the Philosophy of Art. Lecture 3 hours; 3 credits. Prerequisite: One 400/500-level Philosophy course with a grade of "B" or higher (or equivalent). An evaluation of the field of art in relation to the rest of human culture, emphasizing the various approaches that may be used.

PHIL 611. Studies in the History of Philosophy. Lecture 3 hours; 3 credits.

Prerequisite: One 400/500-level Philosophy course with a grade of "B" or higher (or equivalent). A consideration of selected themes in the history of philosophy, or the specific examination of one major philosopher or group of related philosophers.

PHIL 695. Topics in Philosophy. 3 hours; 3 credits. Prerequisites: one 400/500-level Philosophy course with a grade of "B" or higher (or equivalent). The advanced study of selected topics designed to permit small groups of qualified students to work in subjects of mutual interest that, due to their specialized nature, may not be offered regularly.

PHIL 697, 698. Tutorial Work in Special Topics in Philosophy. 1-3 credits each semester. Prerequisites: approval of the department chair and one 400/500-level Philosophy course with a grade of "B" or higher (or equivalent). Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

PHIL 707/807. Ethics in Public Health Practice. 1-3 credits. Prerequisite: open to all graduate students in relevant fields. An investigation of ethical issues in public health policy, practice, and research. Students will develop a capacity for reasoned judgments in these matters by understanding and applying basic moral concepts, theories, and ideals.

PHIL 710/810. International Rights. Lecture 3 hours; 3 credits. Prerequisite: approval of instructor. A philosophical study of rights applicable to the international arena. Theories from the early Modern European period to the present day will be treated. Coverage includes international law, the rights of nations, and human rights.

PHIL 797/897. Tutorial in Philosophy. 1-3 credits each semester. Prerequisite: approval of the department chair. Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

Political Science — POLS

POLS 403/503. First Amendment Freedoms. Lecture 3 hours; 3 credits. Prerequisite: POLS 101S or permission of the instructor. The course deals with the development and practice of conflicting judicial and legal theories concerning our substantive guaranties. Students are asked to act as advocates in developing and substantiating theories of their own.

POLS 410/510. African American Politics. Lecture 3 hours; 3 credits. Prerequisites: 6 hours in social science and junior standing. This course will examine the political development of Black people in the United States by focusing on the relationship and processes of the American political system. In addition, the political dynamics of Black political thought, the Civil Rights Movement, and Black protest politics will also be analyzed.

POLS 412/512. Politics of the Civil Rights Movement. Lecture 3 hours; 3 credits. Prerequisites: six hours in social science and junior standing. Examines the political activities which resulted in the passage of the nation's second Civil Rights policy, the 1960 and 1964 Civil Rights Acts, the 1965 Voting Rights Act and the 1968 Fair Housing Act. The course will analyze the underpinnings, leadership, and political strategies of the Civil Rights Movement.

POLS 414/514. Politics of Education. Lecture 3 hours; 3 credits. Prerequisite: junior standing or permission of the instructor. The question of power, often ignored by education

policy analysts and researchers, is a principal focus of this seminar. Issues ranging from the role of education in political socialization and the politics of affirmative action and equal opportunity are examined.

POLS 415/515. Women and Politics in America. Lecture 3 hours; 3 credits. Prerequisite: POLS 101S or permission of the instructor. Examines women's place in political theory and the practice of politics in the United States. A major focus is to trace the development of women's political rights, the impact of public policy on the lives of American women and to see how women influence and participate in the political process.

POLS 420W/520. Southern Politics. Lecture 3 hours; 3 credits. Prerequisite: POLS 101S or permission of the instructor. This seminar focuses on the politics of the American South from the 1940s to the present. Emphasis is on introducing students to contrasting explanations and analysis about the politics of the American South.

POLS 421/521. International Law. Lecture 3 hours; 3 credits. Prerequisite: 6 hours in political science or permission of the instructor. POLS 325W is recommended. Surveys major areas of public international law (e.g., laws of warfare, law of the sea, conflict resolution, etc.). Emphasizes the relationship between international law and international politics.

POLS 424/524. International Organization. Lecture 3 hours; 3 credits. Prerequisite: 9 hours in international courses, including POLS 100S and 325W, or permission of instructor. Corequisite: POLS 313. Course provides a basis for understanding the role and importance of international organizations in contemporary international relations. Focuses on development and history of global organizations, with particular emphasis on the United Nations, and regional and functional organizations.

POLS 434/534. Political Participation in the United States. Lecture 3 hours; 3 credits. Prerequisite: six semester hours of political science. An examination of current theories and research on political behavior, conventional and unconventional modes of political participation, and the impact of participation on the political system.

POLS 435/535. Chinese Politics. Lecture 3 hours; 3 credits. Prerequisites: POLS 100S, 102, or permission of the instructor. A study of origins of the Chinese revolution; development and functions of the Chinese Communist Party; government institutions; the defense establishment; evolution of foreign policy; and post-Mao political and economic reforms. (cross listed with ASIA 435)

POLS 436/536. Japanese Politics. Lecture 3 hours; 3 credits. Prerequisites: POLS 100S, 102, or permission of the instructor. A study of Japan's historical political development and social patterns; government institutions; problems of the constitution; and foreign and defense policy.

POLS 437/537. International Relations in East Asia. Lecture 3 hours; 3 credits. Prerequisite: POLS 100S. A study of contemporary issues (political, economic, and strategic) in the East Asia area; the interactions of China, Japan, the United States, and the former Soviet republics in East Asia.

POLS 442/542. Twentieth Century Dictatorships. Lecture 3 hours; 3 credits. Prerequisites: six hours of social science, junior standing, or permission of the instructor. A study of the Fascist, Nazi, Stalin and Mao regimes and

the forces that brought them to power and sustained them, including a study of the impact of their policies on their people and neighboring states.

POLS 466/566. Politics of the Middle East. Lecture 3 hours; 3 credits. Prerequisite: junior standing or permission of the instructor. An analysis of the political processes throughout the region and in selected nations of the Middle East. Topics to be discussed include inter-Arab relations, the Arab-Israeli conflict, the Iran-Iraq rivalry and foreign power involvement in the Middle East.

POLS 495/595, 496/596. Topics in Political Science. Lecture, discussion, or seminar 1-3 hours; 1-3 credits each semester. Prerequisite: appropriate survey course or permission of the instructor. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly.

POLS 497/597. Independent Research in Political Science. 1-3 credits. Prerequisite: senior standing or permission of the instructor. Independent research in political science under the supervision of a faculty member. May be repeated up to 6 credit hours.

POLS 602. Seminar in American Foreign Policy. 3 credits. The formulation and conduct of U.S. foreign policy under changing domestic and external circumstances. Models of decision making; interrelationships of economic, political, and military factors; major trends in contemporary American foreign policy making.

POLS 623. Foreign Policy Analysis. Lecture 3 hours; 3 credits. Comparative study of foreign policy behavior. Internal and external factors in formation and implementation of foreign policy. Examination and application of foreign policy models.

POLS 624. National Security Policy. Lecture 3 hours; 3 credits. Examines U.S. national security policy, strategy and the use of force, the formulation and execution of policy, the international dimension of national security, and contemporary issues in national security.

POLS 626. Seminar in Politics of Russia and the Soviet Successor States. Lecture 3 hours; 3 credits. Power and authority in Russia and the other successor states of the former Soviet Union. Although focusing on Russia, the course embraces the contemporary internal politics of the states in the space between Germany and Japan/China including Central Asia and the Caucasus. Emphasizes research methodology and strategies.

POLS 631. Seminar in Chinese Politics. Lecture 3 hours; 3 credits. An advanced survey and research on contemporary Chinese politics, political and economic reforms; intellectuals and politics; China's experience of socialist revolution and economic construction; and foreign policy.

POLS 650. Interdependence, Power and Transnationalism. Lecture 3 hours, 3 credits. Prerequisite: director or instructor's permission. This course covers the fundamental concepts, ideas, and approaches to the study of interdependence and transnationalism. It seeks to expose students to the nature, role, and impact of economic, technological, strategic, and cultural interdependence. Cases of interdependence and transnationalism are explored in the post-Cold War era. Some focus is placed on how interdependence and transnationalism are impacting the power of the state.

POLS 665. International Political Economy. Seminar 3 hours; 3 credits. Analysis of the forces

shaping national and transnational economic institutions and their policies on a range of contemporary issues, including North-South relations.

POLS 666. Politics in the Middle East. Seminar 3 hours; 3 credits. An analysis of political processes in selected nations of the Middle East. Topics to be considered include contemporary Arab nationalism, Zionism, oil politics, and foreign power involvement.

POLS 695, 696. Selected Topics in Political Science. 3 credits each. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly.

POLS 697. Independent Research in Political Science. 1-3 credits. Independent research in political science under the supervision of a faculty member. May be repeated.

Sociology — SOC

SOC 400/500. War and Gender. Lecture 3 hours; 3 credits. Prerequisite: junior or senior standing. In this course students will grapple with issues concerning war, gender roles, and gender in/equality. The course will address gender roles in war throughout history, globally and across cultures. However, the United States military and military involvement in the 20th and 21st century will remain the primary focus. Discussion will include how social norms and ideals of masculinity and femininity shape, and in turn are shaped by, images and realities of war—including gendered aspects of nationalism and just war theories. The military involvement of men, women (and children) in war and in peacetime, as participants and observers, perpetrators and victims, supporters and opponents of war will also be discussed.

SOC 402/502. Child Welfare. Lecture 3 hours; 3 credits. Prerequisite: SOC 201S or permission of the instructor. A study of the historical and social aspects of child care. Among the problems considered are day care, guardianship, foster homes, illegitimacy, adoptions, and institutional care.

SOC 405/505. Social Change and Social Movements. Lecture and discussion 3 hours; 3 credits. Prerequisite: SOC 201S or permission of the instructor. Analysis of the nature and causes of social change, major social movements, and their impact upon contemporary societies.

SOC 421/521. Deviant Behavior. Lecture 3 hours; 3 credits. Prerequisite: SOC 201S or CRJS 215S or permission of the instructor. A study of various definitions and forms of deviant behavior, theoretical explanations of causes of deviant behavior and the impact of deviant behavior on society and the individual. (cross-listed with CRJS 421/521)

SOC 423/523. Women, Health and Healing. Lecture 3 hours; 3 credits. Prerequisite: 6 hours of social science perspective courses or permission of the instructor. An examination of women's experiences with health and illness and women's roles in the health-care system as patients and care providers from a feminist sociological perspective.

SOC 426/526. The Sociology of Minority Groups. Lecture 3 hours; 3 credits. Prerequisite: SOC 201S or permission of the instructor. The study of the process of and responses to the oppression of racial, religious, ethnic, and national minorities in a variety of countries within a historical and comparative perspective. Special emphasis given to American minorities and especially African Americans.

SOC 427/527. Violence Against Women. Lecture 3 hours; 3 credits. Prerequisite: SOC 201S or CRJS 215S or completion of the social science perspective or permission of the instructor. A critical analysis of violence against women as an institution of social control. Examines violence in the context of social and political inequality and feminist critique. Issues explored include pornography, prostitution, sexual harassment, incest, battering and rape. (cross-listed with CRJS 427/527)

SOC 440/540. Health, Illness, and Society. Lecture 3 hours; 3 credits. Prerequisite: 6 hours in the social science perspective or permission of the instructor. The study of social and social-psychological factors related to health, illness, and treatment with a focus on social epidemiology, the medical industry, and health, illness, and sick-role behavior.

SOC 441/541. Drugs and Society. Lecture 3 hours; 3 credits. Prerequisite: SOC 201S or CRJS 215S or permission of the instructor. The study of sociological and social psychological explanations of drug-using behaviors and of legal and medical control of drugs. Topics include changes in the legal status of drugs, cross-cultural and historical variations in the control and use of drugs, and social epidemiology of drug use in contemporary society. (cross-listed with CRJS 441/541)

SOC 446/546. Social Issues Across the Life Cycle. Lecture 3 hours; 3 credits. Prerequisite: 6 hours in sociology or permission of the instructor. This course focuses on age stratification across the life cycle. An analysis of social forces and issues affecting lives at various stages of the life cycle is offered.

SOC 495/595, 496/596. Topics in Sociology. 3 credits each semester. Prerequisite: SOC 201S or permission of the instructor. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule, and will be more fully described in information distributed to all academic advisors.

SOC 497/597, 498/598. Tutorial Work in Special Topics in Sociology. 1-3 credits each semester. Prerequisites: senior standing and approval of the department chair. Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

SOC 610. Applied Social Research Methods. Lecture 3 hours; 3 credits. The application of social science methods to practical problems. The topics of research design, measurement, scaling, sampling, data collection, and research organization will be taught with reference to issues of reliability, validity and ethical concerns. (cross-listed with CRJS 610)

SOC 612. Urban Society in Transition. Lecture 3 hours; 3 credits. The dynamics of urban social change including the three broad change process areas of population, ecology, and social organization; complementary secondary problems and processes emanating from such basic change areas; analysis of representative views of the "future city" and the "good city."

SOC 620. Proseminar in Sociological Theory. Lecture 3 hours; 3 credits. An examination of classical and contemporary sociological theories about the relations between the individual and society; the ways theory shapes and informs the study of social issues; and the relationship between theory, research and practice.

SOC 627. Violence Against Women. Lecture 3 hours; 3 credits. This course examines the many ways in which violence against women functions as an agent of social control. Violence is viewed on a continuum in order to determine how a variety of acts contribute to the subordination of women. Specific types of violence are explored including: wife assault, rape, incest, sexual harassment and pornography. (cross-listed with CRJS 627)

SOC 630. Applied Social Statistics. Lecture 3 hours; 3 credits. Prerequisite: SOC 610. This course is a graduate-level introduction to social statistics as they may be applied to various practical problems. Students will learn the appropriate use of various statistical procedures through discussion and application. (cross-listed with CRJS 630)

SOC 640. Sociological Application of Computer and Data Analysis. Lecture and lab 3 hours; 3 credits. Prerequisite: SOC 610. This course is a graduate-level introduction to the use of the computer in problems of data management and analysis. Students will use existing software packages (SPSS, SAS) to build specified data files and carry out various statistical procedures. (cross-listed with CRJS 640)

SOC 644. Current Feminist Research in Sociology. Lecture 3 hours; 3 credits. The course provides a feminist analysis of the way women and gender traditionally have been studied in mainstream sociology. A minimum of one-third of the course is devoted to feminist critique of conventional conceptual and methodological approaches to gender relations in the social sciences. Feminist epistemological challenges are used to evaluate current research on selected topics reflecting the specialization and research interests of the faculty who teach the course. (cross-listed with CRJS 644)

SOC 650. Research Seminar. 3 credits. Prerequisites: SOC 610 or CRJS 610, SOC 620 or CRJS 620, SOC 630 or CRJS 630, and SOC 640 or CRJS 640. This seminar integrates the skills needed to complete a master's thesis. Exercises include formulating research questions, developing a research design, and writing a publishable paper. Students practice these skills assignments in class and by completing their thesis proposal. (cross-listed with CRJS 650)

SOC 660. Sociology Seminar. Lecture 3 hours; 3 credits. Prerequisites: SOC 610, 620, 630, 640, 6 hours of SOC electives. An examination of contemporary research and policy issues in the study of sociology. The course also provides an overview for specific concentrations in criminal justice and women's studies when necessary.

SOC 668. Internship. 3 credits. Prerequisite: permission of the instructor. Students gain first-hand experience in professional settings which are deemed appropriate given their academic background and career objectives. Students will be required to complete a research project which corresponds to their specific internship placement.

SOC 695/696. Topics of Sociology. Lecture 3 hours; 3 credits. Topics will vary each semester.

SOC 697/698. Independent Study in Special Topics in Sociology. 3 credits. Prerequisite: approval of the department chair. Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

SOC 699. Thesis. 3-9 credits.

SOC 740/840. Demographic Techniques. Lecture 3 hours; 3 credits. Basic methods of demographic analysis. Topics include population

estimation and projection and the measurement of fertility, mortality, and migration.

SOC 795/895. Topics in Sociology. Lecture 3 hours; 3 credits. Prerequisite: 6 hours of graduate credit. Topics will vary by semester.

SOC 797/897. Independent Study in Sociology. 3 credits. Prerequisites: approval of department chair and 6 hours of graduate credit. Independent reading and study on a topic to be selected under the direction of an instructor.

Theatre and Dance

Dance Courses — DANC

DANC 495/595, 496/596. Topics in Dance. 1-3 credits each semester. Prerequisite: appropriate survey course or permission of the instructor. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described by academic advisors.

DANC 497/597, 498/598. Tutorial Work in Special Topics in Dance. 1-3 credits each semester. Prerequisites: senior standing and approval of the department chair. Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

DANC 697/698. Tutorial Work in Special Topics in Dance. 1-3 credits. Prerequisite: graduate standing and approval of the department chair. Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

Theatre — THEA

THEA 441/541. American Theatre. Lecture 3 hours; 3 credits. Prerequisite: THEA 241A, junior standing, or permission of the instructor. A study of dramatic theories and theatre practices as they relate to the development and growth of theatrical art in the United States.

THEA 442/542. Principles of Directing. Lecture 3 hours; 3 credits. Prerequisites: THEA 152, 252 and 352 or permission of the instructor. An examination and practical application of principles of stage direction as influenced by play script, acting talent, set and lighting design, and the technical facilities of production organizations.

THEA 445/545. Experimental Theatre. Lecture 3 hours; 3 credits. Prerequisite: THEA 241A or permission of the instructor. An in-depth study of avant-garde theatre scripts and performance techniques from 1900 to the present.

THEA 447/547. Women in Theatre. Lecture 3 hours; 3 credits. Prerequisite: THEA 241A or permission of the instructor. A study of the contributions women have made to the theatre as actresses, directors/managers, designers, and playwrights, and of their creative problems and methodologies.

THEA 449W/549. Script and Performance Analysis. Lecture 3 hours; 3 credits. Prerequisite: THEA 241A or permission of the instructor. Approaches script and performance analysis by examining the separate elements of action, character, language, music, spectacle or "mise en scene" in order to discover play spine and style as a basis for staging the play. Also examines the method of "scoring a role" or finding character motivations in relation to overall play spine.

THEA 452/552. Acting Four. Lecture 3 hours; 3 credits. Prerequisites: THEA 152, 252, and 352. An advanced scene study class exploring issues of style and period pertinent to portraying characters on stage.

THEA 471W/571. International Film History. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisite: junior standing or permission of the instructor. An examination of world cinema as a technology, a business, an institution, and an art form from its inception to the present. Emphasis is on the narrative fiction film, its technological and aesthetic development, economic organization, and socio-cultural context. Representative classic and contemporary works will be screened and analyzed. (cross-listed with COMM 471W/571)

THEA 479/579. American Film History. Lecture 2 hours, laboratory 2 hours; 3 credits. Prerequisite: junior standing or permission of the instructor. An examination of American motion pictures as an art form, a business and an institution from its inception to the present. Primary attention is accorded to the narrative fiction film, its aesthetic and technological development, economic organization and social impact. This course highlights the many connections between film history and American culture. (cross-listed with COMM 479/579)

THEA 480/580. The Video Documentary II. Lecture 3 hours; 3 credits. Prerequisite: THEA/COMM 380. A production/studio course designed to complement the work developed in Theatre 380: The Video Documentary I. Discussion/presentation topics range from production field work to post-production editing. The final third of the semester will be devoted to compiling the rough footage in post production. (cross-listed with COMM 480/580)

THEA 486/586. Advanced Filmmaking. Lecture 3 hours; 3 credits. Prerequisites: THEA 346, 370, 385, 446 and 483. Offers the advanced film/video maker an opportunity to produce a project beyond the scope of previous classroom projects. Students are permitted into the course solely by instructor approval and only after demonstration of superior skills in subordinate courses and acceptance of a submitted screenplay. (cross-listed with COMM 486/586)

THEA 495/595, 496/596. Topics in Theatre. 1-3 credits each semester. Prerequisite: appropriate survey course or permission of the instructor. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described by academic advisors.

THEA 497/597, 498/598. Tutorial Work in Special Topics in Theatre. 1-3 credits each semester. Prerequisites: senior standing and approval of the department chair. Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

THEA 697/698. Tutorial Work in Special Topics in Theatre. 1-3 credits. Prerequisite: graduate standing and approval of the department chair. Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

Women's Studies — WMST

WMST 401W/501. Women: A Global Perspective. Lecture 3 hours; 3 credits.

Prerequisites: three semester hours in a WMST or WMST cross-listed course. A study of the experiences of women worldwide, focusing largely on women in developing countries. Topics include economic issues, health, violence, political activism, sexuality, maternal and other family roles, and cultural expression.

WMST 460W/560. Feminist Thought. Lecture and discussion 3 hours; 3 credits. Prerequisite: three hours in a WMST or WMST cross-listed course. A study of the renaissance in feminist thought since the 1960s through close readings of key documents and texts. The course covers a variety of feminist perspectives as expressed in both theory and practice.

WMST 470/570. Women's Ways of Knowing/Ways of Knowing Women. Lecture 3 hours; 3 credits. Prerequisite: three semester hours in a WMST or WMST cross-listed course and any introductory social science methods course. The course explores diverse ways of conducting feminist research. Students will explore from an inter- and multi-disciplinary perspective how feminists make inquiries and develop knowledge in the social sciences and humanities.

WMST 495/595, 496/596. Topics in Women's Studies. 3 credits each semester. Prerequisite: junior standing or permission of the instructor. Advanced seminars on selected topics. The subject matter will usually be interdisciplinary. These seminars will be more fully described on the women's studies website and in material distributed each semester to all academic advisors.

WMST 497/597, 498/598. Independent Study. 1-6 credits. Prerequisite: at least one women's studies course. Independent study of an interdisciplinary women's studies topic, or a reading plus internship project to be selected under the direction of a women's studies faculty member. Conferences and papers as appropriate. Tutorial work, either library-based or field work, must be approved by the instructor and the women's studies chair before a student may enroll in the course. No more than three credits of tutorial work may be counted within the basic requirements for the women's studies minor or major.

WMST 668. Internship. 3-6 credits. Prerequisites: graduate standing and instructor approval required. Course provides an opportunity to gain experience working in organizations and government agencies. Students' work should engage with women's issues at the local, regional, national, and/or global levels. Students must work for at least 50 hours per course credit.

WMST 695/795. Selected Topics in Women's Studies. Lecture 3 hours; 3 credits. The advanced study of selected topics which will permit small groups of qualified students to work on subjects of mutual interest under the direction of an instructor. Courses may not be offered regularly; when offered courses will appear in the course schedule and will be more fully described in information distributed to advisors.

WMST 697. Independent Study. 3 credits each semester. Prerequisite: graduate standing. Independent study of an interdisciplinary women's studies topic to be selected under the direction of a women's studies faculty member. Conferences and papers as appropriate.

WMST 795. Selected Topics in Women's Studies. Lecture 3 hours; 3 credits. Prerequisite: Instructor approval required. The advanced study of selected topics which will permit small groups of qualified students to work on subjects of mutual interest under the direction of an instructor. Courses may not be offered regularly; when

offered courses will appear in the course schedule and will be more fully described in information distributed to advisors.

WMST 797/897. Independent Study. 1-3 credits. Prerequisite: graduate standing; doctoral level only for 897. Independent study of an interdisciplinary women's studies topic to be selected under the direction of a women's studies faculty member. Conferences and papers as appropriate.

College of Business and Public Administration

www.odu.edu/~business/

Nancy A. Baganoff, Dean
Ali Ardalan, Associate Dean

Ph.D.	Business Administration Public Administration and Urban Policy
Master's	Accounting (M.S.) Business Administration (M.B.A.) Computer Science (M.S.) Economics (M.A.) Public Administration (M.P.A.)
Certificates	Homeland Security Certificate Maritime, Ports and Logistics Management Advanced Certificate in Public Administration and Policy Modeling and Simulation

College of Business and Public Administration

2004 Constant Hall
Old Dominion University
Norfolk VA, 23529
(757) 683-3520

Old Dominion University's College of Business and Public Administration has as its principal objective the preparation of liberally educated specialists who will enter the challenging world of business or public administration. All programs in the college are designed to promote the following: professional competence; facility in the communication arts; analytical skills; leadership abilities; an understanding of social, political, and economic forces; and, a strong sense of business ethics and public purpose. This foundation enables graduates of these programs to advance in a broad range of careers in the public and private sectors.

The College of Business and Public Administration is one of approximately 469 schools in the world to have achieved accreditation for business programs on the graduate and undergraduate levels by the Association to Advance Collegiate Schools of Business - International (AACSB). The Master of Science in accounting program has received its own accreditation through the same agency. In addition, the Master of Public Administration program is one of approximately 164 graduate programs certified as meeting the standards of the National Association of Schools of Public Affairs and Administration (NASPAA).

The college offers master's degrees in accounting, business administration, economics, and public administration. Also, the college offers a joint master's degree in computer information science with the Computer Science Department. The college also offers a Ph.D. program in business administration and a Ph.D. program in public administration and urban policy.

Also housed within the college is the Department of Military Science and Leadership. The mission of this department is to provide professional instruction and leadership development for selected students who desire to serve in the active or reserve components of the U.S. Army. Additional information about this program may be obtained through the Military Science and Leadership Department.

Vision Statement

The vision of the College of Business and Public Administration is to be recognized as an innovative leader in business and public administration education and to become a valued center of excellence in the mid-Atlantic coast region.

Mission Statement

The college's mission is to develop students, within a global and ethical context, for successful careers in business and government; to perform basic, applied and pedagogical research; and to offer services to the community; all of which support the economic development of Hampton Roads and beyond.

Graduate School of Business and Public Administration

Nancy Bagranoff, Dean
Ali Ardalan, Associate Dean

The Graduate School of Business and Public Administration offers six degree programs: Master of Arts in economics; Master of Business Administration; Master of Public Administration; Master of Science in Accounting; Ph.D. in Business Administration—finance, information technology, management, or marketing tracks; and Ph.D. in Public Administration and Urban Policy. In addition, the school offers a master's in computer information science option jointly with the Computer Science Department.

Graduate courses are taught during the day and in the evening facilitating flexible combinations of formal learning and full- or part-time employment. Students come from a variety of backgrounds with undergraduate degrees from many different colleges and universities.

All graduate students are advised to check specific program requirements before enrolling in 400/500 level courses. Nondegree graduate students must satisfy the admission index for graduate study or receive special permission from the graduate program director in the College of Business and Public Administration in order to enroll for graduate credit.

Master of Business Administration

Bruce Rubin, Graduate Program Director
Shanna Wood, Associate Director

The Master of Business Administration (M.B.A.) program at Old Dominion University is designed to present broad but thorough insights into issues relevant to all effective managers. In an ever changing and increasingly global environment, these skills are applicable to both the private and public sectors. The Old Dominion University M.B.A. program is structured to provide students with the opportunity to design a program of study to meet their individual needs.

The program provides students with a great deal of flexibility to select courses of interest. Some may choose a program with a twelve-hour concentration plus six hours of electives. Others may elect not to choose a concentration and develop a general M.B.A. program with eighteen hours of general electives. Concentrations are available in each of the following areas: Business and Economic Forecasting, Financial Analysis and Valuation, Information Technology, International Business, Maritime and Port Management, and Public Administration.

Additional flexibility is provided by the requirement that each student select three one-hour electives from a wide series of choices. Among the topics included are: effective business writing, business plan development, international business, critical thinking, business ethics, and employment law. Each student will also have to select an advanced course in international business in a discipline of his or her choice.

Students have the opportunity to interact with the business community on projects with faculty supervision. In addition, students may participate in internships. The program leading to the degree of Master of Business Administration is designed for the student whose undergraduate preparation is in non-business areas as well as for students with undergraduate training in business and is open to any qualified holder of a bachelor's degree, regardless of the undergraduate field of study.

The program is designed to accommodate both full-time and part-time students with courses offered during the day as well as in the evening at three locations—the main campus in Norfolk, the Virginia Beach Higher Education Center, and the Peninsula Higher Education Center in Hampton. Case studies, lectures, and independent research projects are major components of an integrated approach to the study of business management, and the M.B.A. program at Old Dominion University is fully accredited by the AACSB - International.

Admission

Prospective students may apply for entrance into the program for the fall, spring, and summer semesters. The Graduate School of Business and Public Administration welcomes applications who have earned bachelor's degrees from accredited institutions. Admission to the program is competitive and is granted only to those who show high ability and likely success in graduate business study. Evidence of ability means that successful applicants will stand well above average in most criteria used to measure graduate promise.

Criteria used for admission include the candidate's score on the Graduate Management Admission Test (GMAT), undergraduate grade averages and the trend of the grades during undergraduate work, letters of reference, a goals statement, and work experience.

The application procedure is as follows: submit to the Admissions Office (1) application forms for graduate study in business, (2) official transcripts of all previous college work, (3) one letter of recommendation, (4) an essay on personal and professional goals, and (5) scores on the Graduate Management Admission Test. Applicants whose native language is not English are also required to submit an acceptable score on the Test of English as a Foreign Language (TOEFL).

Application deadlines for U.S. citizens and permanent residents are June 1 for fall admission, November 1 for spring admission, and March 1 for summer admission. International student deadlines are April 1 (fall semester), October 1 (spring semester), and February 1 (summer semester).

Requirements

College-level calculus is required of all applicants. Students admitted without calculus will have provisional status until the completion of MATH 200 (Calculus for Business & Economics) or its equivalent at another accredited institution which must be taken during the first semester of course work. All students will be required to take an international elective, either as part of their concentration or as a general elective.

Program of Study

Core Hours (27 credit hours)

ACCT 601	Accounting for Managers	3
DSCI 600	Statistics	3
ECON 604	Managerial Econ and International Trade	3
FIN 605	Financial Management	3
MGMT 602	Organizational Management	3
MKTG 603	Marketing Management	3
ECON 612	Global and Applied Macro-Economics	3
IT 610	Information Systems for Managers	3
OPMT 611	Operations Management with Quantitative Analysis	3

Electives (18 credit hours)

General Electives	15
Series of One-Hour Modules	3

Capstone:

MGMT 750 Business Policy & Strategy	3
Total Program	48

Core Course Waiver Policies

Core courses may be waived for students who have at least a 3.0 average in 9 or more designated undergraduate credit hours coursework (designated by each of the respective departments) and who are within 5 years of graduation. Please contact the MBA Program Office for the list of undergraduate courses required for an MBA core class waiver. Course waivers must be approved by the MBA Program Office and are based on departmental recommendations.

Additionally, for those who feel they have the appropriate knowledge but not the coursework, written waiver exams may be taken to demonstrate knowledge equivalent to the core courses. Waiver exams will be offered and graded by the respective departments. Exceptions to waiver by examination can be made if the student has the appropriate undergraduate coursework as described above. Students must complete all waiver exams prior to the start of the second semester of course work. A course may be challenged only one time. Students may complete waiver exams prior to beginning their course work if they choose to do so. Students who waive core courses may waive both the courses and the hours. Students are permitted to waive a maximum of 18 credit hours of the core.

Students may also refer to the Policy on Experiential Learning Credit Options at the Graduate Level found in a previous section of this Catalog.

MBA Electives and Concentrations

Each student must select 18 credit hours of electives from the wide range of electives offered in each of the functional areas in the College of Business and Public Administration: accounting, decision science, economics, finance, information technology, management, marketing, operations management, and public administration as well as the one-hour modules. Students have the flexibility to choose among the electives those that provide them with the educational background they desire. Alternatively, students may choose a concentration from those offered. A concentration consists of, not more or less than, 12 hours of course work beyond the core. All students must select at least one international elective.

M.B.A. Concentrations:

Business and Economic Forecasting:

ECON 625	Mathematical Economics	3
ECON 706	Econometrics I	3
ECON 707	Econometrics II	3
ECON 708	Econometrics III	3

Financial Analysis and Valuation:

FIN 735	Portfolio Analysis	3
FIN 737	International Financial Management	3
FIN 740	Options and Futures Markets	3
FIN 741	Corporation Financial Policy	3
FIN 668	Internship or FIN 697 Selected Topics in Finance	3

Information Technology:

IT 620	Systems Analysis & Design	3
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IT 635	Telecommunication and E-Commerce	3
IT 650	Database Management Systems	3
IT 664	Information Systems Project Management	3
IT 665	Network and Information Systems Administration	3
IT 672	Information Architectures	3
IT 668	Internship or	3
IT 695	Selected Topics in Information Systems	3

International Business Concentration

ECON 752	International Trade	3
ECON 753	International Finance	3
FIN 737	International Financial Management	3
MGMT 721	International Strategic Management	3
MKTG 640	Global Marketing Management	3
PORT 610	International Shipping and Supply Chain Management	3

Maritime and Ports Management Concentration

PORT 610	International Shipping and Supply Chain Management	3
PORT 611	International Maritime Transport	3
PORT 612	Port Operations and Management	3
PORT 613	International Maritime and Admiralty Law	3
PORT 614	Port Planning and Economics	3

Public Administration Concentration

PADM 603	The Environment of Public Administration	3
PADM 651	Introduction to Public Administration	3
PADM 695	Advanced Topics	3
PADM 711	Urban Services Administration	3
PADM 714	Public-Private Partnerships	3
PADM 715	Management of Nonprofit Organizations	3
PADM 718	Contract Management	3
PADM 725	Business, Government and Society	3
PADM 730	Theories of Conflict Resolution and Problem Solving	3
PADM 734	Negotiation and Dispute Resolution	3
PADM 738	Conflict Mediation and Arbitration	3

B.A./M.B.A. Program

A five-year B.A./M.B.A. program is available for selected undergraduate students pursuing a Bachelor of Arts degree. For specific information please refer to the undergraduate catalog.

Doctor of Philosophy in Business Administration (Ph.D.)

Sylvia C. Hudgins, Graduate Program Director

The Doctor of Philosophy degree in business administration (Ph.D.) is a scholarly, research-based program with a professional orientation. The objective of the program is to prepare individuals of superior promise and potential for careers in higher education as faculty members engaged in teaching and research and for high level administrative and research careers in the private and public sectors. Persons completing the degree program must have demonstrated an in-depth knowledge of international business, research methods, and high potential for making significant contributions to their field of specialization in business.

The Ph.D. degree requires competence in basic disciplines of international business, research tools, and in one of the following functional areas of business: finance, information technology, marketing, or strategic management.

Requirements for Admission

Work for the doctoral degree is usually preceded by the successful completion of the a Master's degree in a business related field (i.e. MBA) from a recognized AACSB-accredited college or university. The applicant must submit an application, official transcripts of all college or university-level work, provide scores on the Graduate Management Admission Test taken within the last five years, and provide three letters of recommendation, two from academic references, which attest to the individual's academic potential and ability for achievement. The applicant must also submit a personal statement of goals, approximately two to three pages, on how the completion of the doctoral program will assist in achieving personal and professional career goals.

The completed application materials will be reviewed by the graduate program director and faculty in the major area of study. They will evaluate the individual's abilities and motivation to succeed in the doctoral program. A

personal interview may be required before the admission decision can be reached. A recommendation is made by the faculty and a final decision on admission is made by the graduate program director.

Requirements of the Ph.D. Degree

The following are the minimum requirements for the Ph.D. degree and must be considered in preparing the student's plan of study:

1. Satisfactory completion of at least 57 semester hours of course work including the dissertation for finance curriculum and at least 58 semester hours of course work including the dissertation for information technology, marketing or strategic management curriculums. (At least 48 hours of post-master's course work (including dissertation) is a University requirement);
2. Demonstrated competency in the following areas: international business, research methods and techniques, and the chosen functional field of business. Passage of a comprehensive examination covering international coursework is required.
3. Acceptable performance on a written and oral candidacy examination in the major field of study. A student may retake the candidacy examinations only one time;
4. Completion of a dissertation representing the candidate's ability to conduct scholarly, original research. The quality of this research should be such that it would be worthy of publication in a refereed, scholarly journal; and,
5. Successful oral defense of the dissertation.

Retention Standards

To remain in good standing after admission to the program, students must maintain a minimum, cumulative grade point average of 3.20 in all course work attempted at the University. Students who fall below this minimum standard will have one semester to remedy this deficiency. Further, students may earn no more than three credit hours with the grade of C. Any student receiving a grade lower than C- in course work will be removed from the program.

Time Limitation and Residency

The Ph.D. program assumes that a well qualified and highly motivated student can complete all degree requirements in four years of full-time work. If a student is unable to pursue the degree on a full-time basis, or if the major field is different from previous academic training, more time to complete the degree is usually required. The maximum time allowed to complete all degree requirements is eight calendar years from the date of initial enrollment in the program.

Each student is required to complete at least two regular semesters in full-time residency. These need not be consecutive. Full-time residency is defined as a minimum of nine credit hours per semester.

Transfer Credit

A maximum of 12 semester-hour credits (or equivalent) may be transferred from another university (including six hours earned through experiential learning credit options) and applied toward the Ph.D. course requirements. Transfer credit is approved at the discretion of the program director in consultation with the faculty in the student's major field of study.

Waivers Using Previous Graduate Work

A maximum of nine semester hours of master's-level graduate work may be applied toward completion of the requirements for the doctoral degree. The previous course work must have been of B letter-grade quality or better, and must have been completed within the five years immediately preceding entry into the doctoral program.

Candidacy Examination

The examination qualifying the doctoral student for candidacy for the Ph.D. in business administration is comprehensive in nature and designed to test the student's knowledge of subject matter in the major field, international business, and the ability to engage in independent research. These examinations are given in two parts: 1) international business and 2) field of study. The International Business Exam is a written exam scheduled for the third week of May and may be taken by a student in good standing after the student has completed BUSN 800, MGMT 821, MKTG 826, and FIN 862. The candidacy examination in the field of study is scheduled at the beginning of fall semester classes. Students in

good standing may take the Field of Study Examination after completing all courses in their field which are to be taken during the first two years of the program. See Curriculum. The Field examination contains both a written and oral component. The written portion is administered first. After successful completion of the written examination, the student sits for an oral examination, which includes topics discussed in the written examination and any additional materials that the advisory committee feels are appropriate. The student will be expected to perform well on both the written and oral components of the examination. Rather than being merely pro forma, the oral examination is a serious and integral part of the qualifying procedure for candidacy. A student must pass both the written and oral sections. The candidacy examinations are prepared and evaluated by the examination committees composed of the graduate faculty who are primarily responsible for teaching doctoral courses in international business and the field of study. The results of all examinations are reported to the student and program director.

Dissertation

The dissertation represents the final stage in obtaining the doctoral degree and provides evidence of the student's ability to conduct independent scholarly research. To effectively initiate, conduct, and conclude the dissertation phase of the program, the candidate must: 1) form a dissertation committee; 2) develop and defend a dissertation proposal; 3) complete the dissertation research and report the results in writing; and 4) orally defend the dissertation.

Dissertation Committee

The dissertation committee is formed by the student with the approval of the program director. The committee's purpose is to supervise the selection of the dissertation topic, constructively critique the research methodology, and serve as a guidance body until its completion. The committee should have at least three members, one of whom is from outside the department of the major field of study. The chair of the committee will be from the candidate's major field and be an authority in the field of specialization chosen for the dissertation research. The proposal, dissertation, and the final oral defense of the dissertation must have the majority approval of the members of the dissertation committee and subsequent approval by the program director and dean of the college.

Dissertation Proposal Defense

A candidate will select a topic for dissertation research under the guidance of his/her committee. The candidate will defend a proposal for the dissertation demonstrating the originality of the research, requisite literature review, and the methodology that will be used in conducting the research. The committee will judge the merits of the proposal, making any suggestions and/or additions as deemed necessary, and approve the proposal in writing, providing copies to the program director.

Dissertation Research and Preparation

Progress on the dissertation should be reported on a periodic basis to the chair of the dissertation committee and the appropriate members. In most instances, research results, drafts of the manuscript, and guidance will be forthcoming between the committee and the candidate during the research phase. While preparing the dissertation, candidates must be continuously enrolled for a minimum of one credit hour per semester. The total number of credit hours for the dissertation shall be no less than 18 and no more than 24 credit hours. Advice or assistance from committee members should not be expected unless the candidate is officially enrolled. General regulations and procedures governing the submission of the doctoral dissertation are provided in the University Guide for Preparation of Theses and Dissertations available from the Office of the University Registrar.

Oral Dissertation Defense

The objective of the oral defense of the dissertation is to explore with the candidate the methodological and substantive contributions of the dissertation. Through this process, the examiners and the candidate reach a common understanding of the research area and can mutually agree upon its merits for publication. Majority approval by the examiners constitutes successful completion of the defense of the dissertation. The Doctor of Philosophy in business administration will be awarded upon successful completion of this examination and all other program requirements within the eight-year time limit.

Finance Curriculum

First Year - Fall		
BUSN 800	International Business Seminar	3
ECON 801	Micro-Economic Theory	3
ECON 806	Econometric Theory & Modeling	3
	Spring	
ECON 807	Econometrics II	3
MGMT 821	Seminar in International Management	3
MKTG 826	Seminar in International Marketing Strategy	3
Second Year	Fall	
ECON 808	Econometrics III	3
FIN 860	Seminar in Financial Theory	3
FIN 862	Seminar in International Finance	3
	Spring	
FIN861	Seminar in Investments	3
FIN 863	Seminar Current Financial Topics	3
ECON 852	International Trade	3
Third Year		
FIN 864*	Directed Research Seminar	3
Work on dissertation research		
*Advanced doctoral level statistical/research methods course (3 hrs) can substitute for FIN 864.		

Information Technology Curriculum

First Year	Fall	
BUSN 800	International Business Seminar	3
DSCI 700	Linear Methods for Business Decisions	1
DSCI 711	Multivariate Statistical Methods for Business	3
IT 800	Theoretical Foundation in Info Systems Research	3
	Spring	
DSCI 712	Advanced Statistical Models in Business Research	3
MGMT 821	Seminar in International Management	3
MKTG 826	Seminar in International Marketing Strategy	3
Second Year	Fall	
FIN 862	Seminar in International Finance	3
IT 850	Enterprise Architecture and Computing Algorithms	3
IT 890	Seminar in Business Process and Enterprise Systems	3
	Spring	
IT 891	Seminar in Business Intelligence	3
IT 892	Seminar in Knowledge Management	3
IT 893	Seminar in Supply Chain in E-Business Environment	3
Third Year		
Work on dissertation research.		
IT 895 (3 hrs) or other research methodology courses at the approval of PhD Area Coordinator.		

Marketing Curriculum

First Year	Fall	
BUSN 800	International Business Seminar	3
DSCI 700	Linear Methods for Business Decisions	1
DSCI 711	Multivariate Statistical Methods for Business	3
MKTG 801	Marketing Theory Seminar	3
	Spring	
DSCI 712	Advanced Statistical Models in Business Research	3
MKTG 826	Seminar in International Marketing Strategy	3
MGMT 821	Seminar in International Management	3
Second Year	Fall	
MKTG 803	Seminar in Consumer Behavior	3
MKTG 813	Fundamentals of Survey Research	3
FIN 862	Seminar in International Finance	3
	Spring	
MKTG 827	Seminar in Marketing Strategy	3
MKTG 814	Seminar in Advanced Marketing Methodology	3
MKTG 802	Seminar in Marketing Concepts and Issues	3
Third Year		
MKTG 895*	Selected Topics	3
Work on dissertation research		
*Advanced doctoral level statistical/research methods course (3 hrs) can substitute for MKTG 895.		

Strategic Management Curriculum

First Year	Fall	
BUSN 800	International Business Seminar	3
DSCI 700	Linear Methods for Business Decisions	1
DSCI 711	Multivariate Statistical Methods for Business	3
MGMT 840	Strategy Classics	3
	Spring	
DSCI 712	Advanced Statistical Models in Business Research	3
MGMT 835	Seminar in Organization Theory	3
MKTG 826	Seminar in International Marketing Strategy	3
Second Year	Fall	
MGMT 842	Strategy Process	3
MKTG 813	Fundamentals of Survey Research	3
FIN 862	Seminar in International Finance	3
MGMT 830	Strategic Human Resource Management	3
	Spring	
MGMT 845	Seminar in Strategy Content Research	3
MGMT 821	Seminar in International Strategic Management	3
MKTG 814	Seminar in Advanced Marketing Methodology	3
Third Year		
Work on dissertation research		

Homeland Security Certificate

The need to address problems related to Homeland Security is increasing in numerous government and private organizations. This certificate program in Homeland Security is designed to provide knowledge useful in the development and improvement of organizational processes related to avoiding, preparing for, dealing with and recovering from major security-related problems. The certificate allows students to draw courses from several colleges of the University to tailor a program particularly suited for their needs.

Admission Requirements

Admission to the certificate program will require a bachelor's degree (or equivalent).

Program requirements

The Homeland Security Certificate Program consists of 12 credit hours of graduate level course work that can be taken across colleges. The four courses comprising the certificate program will be offered on a regular schedule to enable the completion of the program in two years. The program will provide the opportunity for students to further their knowledge and become more competent in their profession.

The program consists of three tracks. Courses are taught in Business, Engineering and Arts and Letters. An overall grade point average of 3.0 or better is required to earn the certificate.

Required courses are ENMA 724 Risk Analysis and PADM 695 Disaster Management.

Students may elect to take ENMA 714 Crisis Project Management in place of ENMA 724 with approval.

Track One: CEE 513 Geographic Information Systems, ENGN 622 Remote Sensing

Track Two: PORT 612 Port Operations and Management, PORT 614 Port Planning and Economics

Track Three: Students may choose any two courses from the following list: IS 701/801 Global Change and American Foreign Policy, IS 702/802 Collective Security, IS 706/806 Causes of War, IS 707/807 Interdependence, Power and Transnationalism, IS 720/820 Global Security, IS 740/840 The Political Economy of Development, IS 795/985 Politics of Middle East, IS 795/895 Islam, War and National Question on the Russian Frontier, CRJS 575 Comparative Justice (from Sociology and Criminal Justice)

Maritime, Ports and Logistics Management Certificate

This certificate program is designed to help working maritime and port professionals develop and sharpen their maritime and port management skills. The program consists of four graduate courses that expose students to international shipping, port management, maritime law, port operations and planning and port economics.

Admission Requirements

Admission to the certificate program will require a bachelor's degree (or equivalent).

Program Requirements

The certificate is awarded based upon the student's successful completion of 12 credit hours of graduate level courses in Ports and Maritime Management: PORT 611: International Maritime Transport; PORT 612: Port Operations and Management; PORT 613: International Maritime and Admiralty Law; and, PORT 614: Port Planning and Economics.

Department of Accounting

2157 Constant Hall
(757) 683-3529

Master of Science-Accounting

Yin Xu, Graduate Program Director

Accounting services are becoming both broader and more specialized. The major changes that have occurred in the accounting profession dictate expanded and updated educational programs. The minimum education necessary for the professional accountant cannot be achieved in four years of undergraduate study. For instance, the Virginia Board of Accountancy requires Certified Public Accountant (CPA) exam candidates to have 150 semester hours of education for licensure. Therefore, the ideal model for a professional accounting education embodies a Master of Science in Accounting program that augments a broad undergraduate education. The program is designed to accommodate both full-time and part-time students with courses offered in the evenings.

Admission Requirements

Prospective students may apply for admission to the program for the fall, spring, and summer semesters. The Department of Accounting welcomes applicants who have earned bachelor's degrees from accredited institutions. Admission to the program is competitive and is granted only to those who show high ability and likely success in graduate business study. Successful applicants will stand well above the average in most of the criteria used to measure graduate student promise.

Criteria used for admission include the candidate's score on the Graduate Management Admission Test (GMAT), undergraduate grade point averages and the trend in grades during undergraduate work, one letter of reference, a goals statement, and previous work experience. Students must earn a grade of B- or better in each undergraduate business course used to satisfy the program's prerequisite courses.

The application process is as follows: submit to the Graduate Admissions Office (1) application forms (may be done on-line) for graduate study in business, (2) official transcripts of all previous college work, (3) one letter of recommendation, (4) an one-page essay setting forth the applicant's work experience, and goals and objectives for the program, and (5) scores on the Graduate Management Admission Test (GMAT). Applicants whose native language is not English are also required to submit an acceptable score on the Test of English as a Foreign Language (TOEFL) Exam.

Prior to admission, each candidate must have completed six hours of financial accounting, ACCT 201 and ACCT 301 or equivalent courses; six hours of management accounting, ACCT 202 and ACCT 311 or equivalent courses; and three hours of taxation courses, ACCT 421 or an equivalent course. In addition, each candidate must have completed eighteen credit hours in economics, statistics/decision sciences, marketing, management, finance, and commercial law.

Application deadlines are July 1 for fall admission, November 1 for spring admission, and April 1 for summer admission. International student deadlines are April 15 (fall semester), October 1 (spring semester), and February 15 (summer semester).

Applicants who have not obtained an acceptable GMAT score, or an acceptable TOEFL score for those applicants whose native language is not English, will not be permitted to enroll in graduate accounting courses.

Fast-Track Undergraduate Admission

Undergraduate students majoring in Accounting at Old Dominion University may apply for conditional status in the Master of Science in Accounting program after completing ACCT 301, Intermediate Accounting I, with a minimum Overall and Accounting Grade Point Average of 3.00. These students can then achieve regular admission status by completing their undergraduate degree with a minimum Overall and Accounting Grade Point Average of 3.00, and obtaining an acceptable GMAT score.

Degree Requirements

A minimum of 30 semester hours of graduate courses are required to complete the Master of Science in Accounting. Students must maintain a cumulative grade point average of a least 3.00 in all graduate work taken. Additionally, students must successfully complete at least one part of one of the following professional exams during the final two semesters of their graduate course work: Certified Public Accountant (CPA) exam, Certified Management Accountant (CMA) exam, or Certified Internal Auditor (CIA) exam. Students who already hold one or more of these professional designations must successfully complete at least one part of one of the other professional exams during the final two semesters of the graduate work.

The Program of Study

The program of study is designed for the student interested in a professional career in accounting either as an assurance services provider (auditor) or management accountant in public accounting or in industry and government. The curriculum, especially the required courses, are designed to improve the student's chances of passing the Certified Public Accountant (CPA) exam. However, there is enough flexibility in the choice of electives to tailor programs of study to successfully complete other certification exams such as: Certified Internal Auditor (CIA), Certified Management Accounting (CMA), Certified Information Systems Auditor (CISA), and the Certified Fraud Examiner (CFE) exams. Additionally, a student completing the four auditing courses meets the requirements of the Institute of Internal Auditors Endorsed Internal Auditing Program.

Required Courses—Accounting		Credits
ACCT 626	Financial and Global Accounting	3
ACCT 630	Financial Statement Analysis	3
ACCT 631	Advanced Financial Auditing	3
ACCT 640	Professional Ethics and Legal Issues in Accounting	3
TAX 650	Tax Strategies for Business Decisions	3
ACCT 727	Strategic Cost Management	3
Total Required Accounting Course Work		18
Six Hours of graduate accounting courses, excluding ACCT 601		6
Elective Courses	Six hours of graduate business or public administration courses at the 600 level.	6
Total Hours		30

Department of Economics

2044 Constant Hall
(757) 683-3567

Christopher B. Colburn, Chair

Master of Arts—Economics

David D. Selover, Graduate Program Director

The Master of Arts in economics is a flexible degree that can meet a wide range of student needs. The program allows students to pursue a traditional approach as preparation for entry into a doctoral program or an applied approach geared toward policy analysis in a specialized area.

Some graduates of the M.A. in economics have chosen to continue their graduate training and have successfully completed Ph.D. programs at universities across the nation. Other graduates have become economics teachers, primarily at the community-college level. Others have gone to research and analysis positions in governmental agencies and private business firms. Finally, still others have chosen to pursue careers in general business management.

All students in the program are trained in theory and research methods, and take several courses emphasizing business or government policy analysis in chosen specialty areas. An independent research project is required, permitting students to apply theory and empirical techniques to real-world problems.

The Department of Economics also encourages interdisciplinary training. The master's program can be adapted for students desiring a diverse background by combining economics with graduate courses in sociology, political science, computer science, statistics, mathematics, finance, management, marketing research, or public administration.

Admission

In addition to the University's graduate admission requirements, applicants seeking regular admission must have at least a 3.00 grade point average in their major. In addition, applicants are required to take either the Graduate Record Examination or Graduate Management Admission Test, and they must submit at least one letter of recommendation. If the undergraduate grade point average falls below that required for regular status, applicants may qualify for provisional admission.

Requirements

Undergraduate prerequisites include principles of economics, calculus (three hours), statistics (six hours), intermediate microeconomics, and intermediate macroeconomics with grades of at least B-.

Thirty semester hours of approved graduate work are required for the award of the Master of Arts degree in economics. A maximum of six hours of 500-level courses approved for graduate credit may be applied toward the degree. The remaining 24 hours of credit must be taken from 600- and/or 700-level courses. Up to six hours of electives (approved by the graduate program director) may be taken from courses outside the Department of Economics. Required core economics courses for the graduate program are ECON 625, 701, 703, and 706. Writing skills commensurate with the level of this degree are also a requirement for graduation from this program.

Near the completion of formal course work, candidates conduct independent research projects with thesis or non-thesis options. Students who choose the thesis option should register for ECON 699 in the final semester. Six hours of credit are given for this course. The thesis is guided and approved by the committee of at least three members of the department. Detailed instructions, requirements, and deadlines are contained in the guide for Preparation of Theses and Dissertations, available from the Office of Graduate Studies web site, <http://www.odu.edu/graduatestudies>.

Students who choose the non-thesis option register for ECON 697 and ECON 698 in the last semesters of course work. Non-thesis students conduct independent research projects under the guidance of a department faculty member. Students must first register for ECON 697, a reading course under the supervision of a faculty member, for three credits, and then register for ECON 698, the research project writing course, also under the supervision of a faculty

member, for three credits. All master's candidates must pass written comprehensive examinations covering microeconomics, macroeconomics, econometrics I, and one elective course area selected by the student.

Required Courses – Economics

ECON 625	Introduction to Mathematical Economics	3
ECON 701/801	Advanced Economic Analysis: Microeconomics	3
ECON 703/803	Advanced Economic Analysis: Macroeconomics	3
ECON 706/806	Econometrics I	3

Four Elective Courses

(These are generally 600- or 700-level courses from within the economics discipline.)

However, two of the courses may be approved 500-level courses, and two of the courses may be outside of the Department of Economics.)

ECON 697	Readings in Economics	3
ECON 698	Economic Methodology and Research	3
Total Hours		30

Department of Information Technology and Decision Sciences

2074 Constant Hall
(757) 683-3488

G. Steven Rhiel, Chair

Master of Science—Computer Science Major with an Emphasis in Computer Information Sciences

Samuel F. Copping, Graduate Program Director

The Department of Information Technology and Decision Sciences offers this degree program jointly with the Department of Computer Science; please see the entry under the Department of Computer Science for degree requirements.

Graduate Certificate in Modeling and Simulation (M&S) for Business and Public Administration

Business applications constitute some of the earliest used simulation modeling, with some dating back over 50 years, and the literature of many businesses and social science disciplines is rich with both practical and theoretical usage of simulation. Recent developments in simulation, such as agent-based simulation and virtual worlds, open even avenues for M&S applicability. This certificate gives CBPA graduate students an opportunity to develop competency in Modeling and Simulation.

Admission Requirements:

Admission to the certificate program requires a bachelor's degree (or equivalent).

Program Requirements:

The Certificate requires four (4) three-hour courses for a total of twelve (12) credits. A basic simulation core of three or six credits is required, plus six or nine credits of discipline-specific work. A 3.00 GPA for the four-course sequence is required for successful completion.

CBPA M&S Certificate – Version 1

MSIM 611 – M&S Fundamentals part 1

MSIM 612 – M&S Fundamentals part 2

DSCI 721/821 – Simulation Modeling for Business Systems

DSCI 722/822 – Agent-based Simulation Modeling

For students with substantial mathematics and computing backgrounds, MSIM 601 may replace MSIM 611 and 612. A fourth course must be chosen to complete the 12-hour credit requirement.

Department of Urban Studies and Public Administration

2090 Constant Hall
(757) 683-3961

Berhanu Mengistu, Chair

Master of Public Administration

The mission of the Master of Public Administration program at Old Dominion University is to prepare students for careers as professionals in public service and to provide students who have considerable experience in the public sector an opportunity to enhance their professional knowledge, skills, and abilities, enabling them to advance their careers.

Curriculum

The MPA curriculum consists of 39 credit hours (13 courses). Courses are required in two categories:

Core Concentration (seven required courses)

Electives (six courses)

Core Curriculum

The following courses are required of all public administration students.

PADM 651 Administrative Theory I: The Context of Public Administration
PADM 652 Administrative Theory II: The Process of Public Administration
PADM 671 Public Budgeting and Financial Management
PADM 701 Public Policy Analysis and Evaluation
PADM 733 Legal and Ethical Foundations of Public Administration
PADM 753 Research Methods for Public Administration
PADM 746 Capstone Seminar in Public Administration

Electives (18 Credit Hours)

Students may take elective courses in a number of different areas related to Public Administration. Students may choose to focus their elective courses in specific areas, such as: Human Resource Administration; Port and Maritime Management; Urban Research and Planning; Non-Profit Management; or other specific areas relevant to Public Administration. Students may also choose to take their elective courses in the general area of Public Management. With the approval of the MPA Program Director students may take Graduate level courses outside of the Department.

MPA Elective courses include the following:

PADM 632 Environmental Planning
PADM 633 Methods of Urban Planning
PADM 634 Regional Planning
PADM 640 Urban and Regional Issues
PADM 655 Theories of Public Organization
PADM 672 Public Financial Management
PADM 695 Advanced Topics *
PADM 702 Urban Resource Allocation
PADM 704 Methods of Public Program Evaluation
PADM 705 Urban Law and Public Policy
PADM 708 Urban and Regional Economic Development
PADM 711 Urban Services Administration
PADM 712 Emergency Management and Policy
PADM 714 Public-Private Partnerships
PADM 715 Management of Nonprofit Organizations
PADM 718 Contract Management
PADM 719 Leadership
PADM 720 Public Personnel Administration
PADM 723 Ethics in Public Administration

PADM 724 Administration of Human Services
PADM 725 Business, Government and Society
PADM 730 Theories of Conflict Resolution and Problem Solving
PADM 734 Negotiation and Dispute Resolution
PADM 737 Digital Government
PADM 738 Conflict Mediation and Arbitration
PADM 745 Managing Development and Change in Organizations
PADM 781 Intergovernmental Management
PADM 795 Advanced Topics in Public Personnel Administration

**From time to time courses under the heading of PADM 695 "Advanced Topics" will be offered that students may choose to take as electives.*

Recommended Course Sequence

Students are required to enroll in Administrative Theory I: The Context of Public Administration (PADM 651) and Administrative Theory II: The Process of Public Administration as early as possible in their program of study. Research Methods (PADM 753) should be completed before students enroll in Public Policy Analysis and Evaluation (PADM 701). The remaining core courses are not required to be taken in a specific order however, the Capstone Seminar (PADM 746) must be taken after the other core courses have been completed (or in the same semester as the last of the core courses are being completed). Students should note that core courses are rarely offered during the summer term and should plan accordingly.

Internship/Field Experience

Practical professional experience in a public or nonprofit agency setting is an important component of the MPA curriculum. A formal internship is required for students who lack significant experience in a public or nonprofit agency. Internships give students the opportunity to gain professional level experience and provide government or nonprofit agencies with the services of graduate students with high potential for future achievement. MPA students have the opportunity to earn three semester credits for internships and apply these credits as one of their electives. PADM 668 Internship/Field Experience is a 300-hour public service experience in an approved agency. Please contact Dr. Alkadry with specific questions you may have regarding internships, malkadry@odu.edu.

The Application Package

The Old Dominion University Graduate Application can be downloaded from the website, www.odu.edu, or a Graduate Application Package may be received by calling (757) 683-3637. This package includes all forms necessary to apply to the Master of Public Administration program. To be considered for admission, applicants must submit the following:

1. An official transcript of previous college degree program(s).
2. A written statement describing how one's experience in work and in other settings and the choice of graduate study in public administration will lead to achieving career goals;
3. Scores on the aptitude section of the Graduate Record Examination (GRE) or the Graduate Management Admission Test (GMAT), taken within the past six years. The requirement for the GRE or GMAT may be waived for applicants with at least three years supervisory, managerial or professional level experience in a local, regional, state, federal, military or nonprofit agency. Applicants who wish to be exempted from the GRE or GMAT requirement should complete the "Request for GRE/GMAT Waiver" form and submit it with their application package for review by the admissions committee. The decision to waive the GRE or GMAT is the sole responsibility of the admissions committee and its decision is final;
4. Two letters of recommendation (forms provided) from academic sources or employment supervisors; and
5. Applicants whose native language is not English are required to submit an acceptable score on the Test of English as a Foreign Language (TOEFL).

Financial Assistance

Financial aid is available to graduate students at Old Dominion University. Financial aid may be available in the form of University fellowships, tuition grants, and research assistantships. The M.P.A. program offers graduate research assistantships each semester. Research assistantships provide stipends, and research assistants pay the in-state tuition rate. In addition to the financial

aid offered by the University, graduate students may be eligible for aid and student loans administered by other agencies. For information about part-time employment, scholarships, and student loans, contact the Office of Student Financial Aid.

For information and forms concerning application, contact the Admissions Office, Old Dominion University, Norfolk, VA 23529 Phone: (757) 683-3637.

For information concerning financial aid, contact the Office of Student Financial Aid, Old Dominion University, Norfolk, VA 23529 Phone: (757) 683-3683.

For information about on-campus housing, Contact the Director of Housing Operations, Old Dominion University, Norfolk, VA 23529 Phone: (757) 683-4283.

Visit the Old Dominion University web site at: <http://www.odu.edu>.

Master of Urban Studies (M.U.S.)

Leonard Ruchelman, Graduate Program Director
Meg Jones, Program Manager

The Master of Urban Studies program is designed to meet the need for public and nonprofit sector administrators, analysts, and evaluators who seek a multidisciplinary approach to the study of processes. The program offers a curriculum that introduces students to the study of the urban environment and provides students with conceptual tools in urban public management as well as basic urban data analysis and program analysis research skills.

The Master of Urban Studies degree is offered by the Department of Urban Studies and Public Administration. The department offers a broad selection of courses in urban studies and public administration to which students may add approved electives offered by other departments in the Graduate School of Business and Public Administration courses in economics, management, marketing, finance, and information systems. Urban studies students also may take courses in the Department of Sociology and Criminal Justice, Political Science and Geography, and other academic departments offering graduate courses relevant to urban affairs.

The Master of Urban Studies program has been offered at Old Dominion since 1974.

Degree Requirements Curriculum

The curriculum consists of 36 credit hours (11 courses) and a three credit hour directed research course. Courses are required in the following categories:

1. Six core courses that all students must complete – 18 hours
2. Five specialization courses determined and selected by the student in conjunction with the graduate program director – 15 hours
3. The urban capstone project – 3 hours

The Core Module

The following courses are required of all urban studies students. These core courses introduce the field of urban studies and demonstrate analytical and research approaches that focus on the urban environment. (18 semester hours)

Course Number

URBN 607	Urban Research Methods	3
URBN 690	Introduction to Urban Studies	3
URBN 701	Urban Policy Analysis	3
URBN 702	Urban Resource Allocation <i>OR</i>	
ECON 545	Urban Economics <i>OR</i>	
URBN 708	Urban Economic Development	3
URBN 704	Methods of Program Evaluation	3
URBN 705	Urban Law and Public Policy	3

The Specialization Module

The urban studies program offers specializations in two specific areas. In addition, students may design and select a five course individual specialization area which is appropriate for their particular career goals in the public or not-for-profit sector. Individual specialization areas must be selected in consultation with a faculty advisor or the M.U.S. graduate program director. Students may select appropriate elective courses within other departments of the Graduate School of Business and Public Administration or in other colleges within the University.

The following is a listing of recommended courses for each of the two specializations. (15 semester hours)

Policy Analysis and Program Evaluation

PADM 603	Environment of Public Administration	3
PADM 671	Public Budgeting Systems	3

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URBN 711	Urban Services Administration	3
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With permission of the graduate program director, students may take appropriate courses from other colleges and disciplines.

Community Services and Planning

PADM 603	Environment of Public Administration	3
URBN 633	Methods of Urban Planning	3
PADM 730	Theories of Conflict Resolution and Problem Solving	3
PADM 781	Intergovernmental Management	3
URBN 632	Environmental Planning	3
URBN 634	Regional Planning	3
URBN 711	Urban Services Administration	3

With permission of the graduate program director, students may take appropriate courses from other colleges and disciplines.

The Urban Capstone Module

All urban studies students must complete URBN 685 Urban Capstone, a significant independent study project under the supervision of a faculty advisor as the capstone experience of the degree program (three credit hours).

Internship/Field Experience

Practical professional experience in a public or non-profit agency setting is an important asset for all urban studies students. A formal internship is strongly recommended for students who lack significant experience in a public or nonprofit agency. Internships give students the opportunity to gain professional level experience in a government or non-profit agency and provides agencies with the services of graduate students with high potential for future achievement. M.U.S. students have the opportunity to earn three semester credits for internships and apply these credits to any specialization area they have chosen. The URBN 693 Internship/Field Experience course is a 300 hour public service experience in an approved agency.

Admission Requirements

The department faculty welcomes applicants who have earned a bachelor's degree from an accredited institution.

Admission to the program is competitive and is granted only to those who show ability and likely success in graduate study. The applicant must meet the requirement of an overall grade point average of 2.80 on a 4.00 scale. Applicants must provide scores from the Graduate Record Examination taken within the past five years. To request a waiver, see the section for application package. Prospective students may apply for admission to the Master of Urban Studies program throughout the year.

The decision to admit an applicant to the master's program is based on a balanced review of official transcripts (particularly in the last two years of undergraduate education), the written statement of career objectives, a review of work experience for in-service students, and written recommendations.

The Application Package

The Old Dominion University Graduate Application Package may be received by calling (757) 683-3637. This package includes all forms necessary to apply to the Master of Urban Studies program. To be considered for admission, applicants must submit the following:

1. An official transcript of all previous college degree program(s);
2. A written statement describing the purpose of seeking the Master of Urban Studies degree, i.e., how the degree will contribute to career goals and objectives (800 word minimum);
3. Two letters of recommendation (forms provided) from academic sources or employment supervisors;

Applicants must provide scores from the Graduate Record Examination taken within the past five years. (Applicants with three or more years of managerial or professional experience in public or non-profit organizations may request a waiver of the Graduate Record Examination requirement by submitting a job description and detailed information on the Request for GRE Waiver form; and

Applicants whose native language is not English are required to submit an acceptable score on the Test of English as a Foreign Language (TOEFL).

Doctor of Philosophy - Public Administration and Urban Policy

John C. Morris, Graduate Program Director
Meg Jones, Program Manager

The principal objective of the Ph.D. in Public Administration and Urban Policy is to assure that graduates become content area experts with 48 hours of doctoral level course work and 12 hours of dissertation credit. Specifically, students will learn a common body of knowledge in three areas: foundation in public and urban policy (12 hours of core courses), one of either of two tracks with courses specific to public administration or urban policy (12 hours of concentration courses), and the foundation in research (12 hours of quantitative and qualitative research courses). Each student will also complete nine hours of unique cognate courses selected by the student with advice and consent of the Ph.D. program director. Each student will also complete three hours of dissertation seminar. Through this approach, all program graduates will have the opportunity to develop a substantive knowledge of a body of work in public administration and urban policy as well to acquire analytical and research skills that will enable them to become educators, leaders and researchers in their chosen specialty areas. The Ph.D. program in Public Administration and Urban Policy, therefore, will focus on: (1) developing effective public, non-profit sector and urban policy leaders throughout Hampton Roads, the Commonwealth of Virginia, and the nation who have both content knowledge and research skills; (2) educating individuals who intend to pursue teaching as a vocation in colleges and universities in Virginia as well as nationally and internationally; (3) building collaborative research and demonstration initiatives with community and state agencies that link research initiatives to public management and urban policy improvement and economic development; and (4) providing the linkages among content knowledge, research, and field experiences for all doctoral students.

Admission

Applications for admission to the program will be considered once per year in April. Students generally begin classes in the fall, but admitted students may enroll in the summer after they are admitted.

Candidates for the doctoral program must have a master's degree in an appropriate discipline in a program that is accredited by an appropriate specialized accrediting agency and from an institution of higher education that is regionally and/or nationally accredited. A minimum grade point average of 3.25 (on a 4.0 scale) overall and in the major area of study in the master's degree and an acceptable score on the Graduate Record Examination (GRE); a minimum score of 500 on the verbal section is required. Applicants whose native language is not English must score a minimum of 550 on the Test of English as a Foreign Language. Upon admission, the student must contact the Ph.D. Program Director in the Department of Urban Studies and Public Administration for advisement.

A student seeking admission to the doctoral program should request an application from the Office of Graduate Admissions of Old Dominion University. The application should be filled out completely and promptly returned to the Office of Graduate Admissions.

Each application must contain the following materials:

1. Three letters of recommendation, at least one from an academic source and one from a professional source; and
2. A three to six-page double-spaced written statement of academic and professional goals.
3. Official copies of transcripts from all institutions of higher education attended and
4. Aptitude scores on the Graduate Record Examination (GRE) taken within five years prior to application for admission must be sent directly to the Office of Admissions.

Financial Aid

Old Dominion University offers financial assistance to graduate students. Types of aid include research assistantships, fellowships, grants, scholarships, and part-time employment. Nearly all forms of aid require that the student be engaged in full-time graduate study, and in the case of assistantships, students are required additionally to work 20 hours per week with an assigned faculty member.

Students may receive an assistantship or fellowship or sometimes a combination of both. Amounts for assistantships are typically \$5,000 to \$11,000 and fellowships from \$5,000 to \$15,000. College funds affect fellowship and assistantship amounts. Tuition is waived for research assistants.

In addition to financial aid offered by the University, graduate students may be eligible for aid administered by other agencies. For information about part-time employment, scholarships, and student loans, contact the Office of Student Financial Aid, Old Dominion University, Norfolk, VA 23529-0052, (757) 683-3683.

Prerequisites

Applicants who have insufficient background in any of the prerequisite competency areas (PADM 651 Administrative Theory I: The Context of Public Administration, ELS 732 Quantitative Research Design or CHP 640 Data Interpretation Methods for Health Care) will be required to enroll in courses in the area(s) of deficiency. Such courses must be completed with a grade of B or better. These prerequisite courses will not be included in the required credit hours to complete the doctoral program.

Students taking ELS 732 should plan to take ELS 832 as the multivariate statistics course. Students taking CHP 640 should plan to take HLSC 811 as the multivariate statistics course.

Course Offerings

Students are required to complete a minimum of 45 hours of course work and maintain a minimum grade point average of 3.0 or better. Up to 12 hours of appropriate course work beyond the master's degree and with a grade of B or better may be transferred into the program with the approval of the Ph.D. Program Director. In addition to course work, students are required to take three hours of dissertation seminar and a minimum of 12 hours of dissertation credit.

CORE COURSES (12 hours)	
PAUP 801	Public Policy Analysis 3
PAUP 807	Urban Theory and Practice 3
PAUP 808	Administrative Theory and Behavior 3
PAUP 810	Public Law and Urban Governance 3
RESEARCH CORE COURSES (12 hours)	
PAUP 802	Logic of Social Inquiry 3
HLSC 812	Qualitative Research Methods or
ECI 890	Qualitative Research Design 3
ELS 832	Statistics Applied to Research in Education and Human Services II or
HLSC 811	Quantitative Research Design – Multivariate 3
PAUP 853	Research and Evaluation Design 3
MAJOR (CONCENTRATION) (12 hours)	
Public Administration Track - Students may select four of the following courses for their concentration:	
Course Number	
PAUP 804	Program Evaluation 3
PAUP 811	Urban Services Administration 3
PAUP 814	Public-Private Partnerships 3
PAUP 820	Public Personnel Administration 3
PAUP 823	Ethics and Public Administration 3
PAUP 830	Theories of Conflict Resolution and Problem Solving 3
PAUP 834	Negotiation and Dispute Resolution 3
PAUP 838	Conflict Mediation and Arbitration 3
PAUP 845	Organization Development and Change Management 3
PAUP 881	Intergovernmental Management 3
PAUP 898	Directed Research 3
Urban Policy Track - Students may select four of the following courses for their concentration:	
Course Number	
PAUP 806	Urban Resource Allocation 3
PAUP 804	Program Evaluation 3
PAUP 805	Urban Law and Public Policy 3
PAUP 811	Urban Services Administration 3
PAUP 814	Public-Private Partnerships 3
PAUP 823	Ethics and Public Administration 3
PAUP 830	Theories of Conflict Resolution and Problem Solving 3
PAUP 834	Negotiation and Dispute Resolution 3
PAUP 838	Conflict Mediation and Arbitration 3
Other course offerings by the department may be considered for substitution for courses listed in each concentration track.	
MINOR (COGNATE)	(9 hours)

Courses may be taken outside of USPA, including, but not limited to, the following: international management, marketing, finance, accounting, educational leadership, business and government, community health, urban economics, industrial psychology, criminal justice, sociology, political science, and engineering management.

DISSERTATION SEMINAR (3 hours)

PAUP 896	Dissertation Seminar	3
DISSERTATION		12
Total Hours		60

Advanced Certificate in Public Administration and Policy

Leonard I. Ruchelman, Graduate Program Director
Marjorie R. Willis, Program Manager

The Department of Urban Studies and Public Administration in the College of Business and Public Administration at Old Dominion University offers an Advanced Certificate in Public Administration and Policy for individuals who submit evidence of having completed a master's degree at an accredited college or university. The objective of the program is to help working professionals upgrade their skills in the areas of policy analysis and public management, by developing analytical and management capabilities.

A student enrolling in the certificate program may be eligible to apply to the Ph.D. program in Public Administration and Urban Policy (PAUP). If accepted, the full 12 credit hours earned in the certificate program may be transferred into the Ph.D. Program.

All courses are taught in the evening.

Curriculum: The curriculum consists of five tracks of courses listed below. Students are required to take four courses, a total of 12 credit hours, to complete the certificate program. Each is to be seen as a specialty in the field of public administration and policy. WITH GUIDANCE FROM A FACULTY ADVISOR, THE STUDENT SELECTS A TRACK.*

Conflict Resolution and Negotiation

PADM 730	Conflict Resolution and Problem Solving	3
PADM 734	Negotiation and Dispute Resolution	3
PADM 738	Conflict Mediation and Arbitration	3
PADM 745	Managing Development and Change in Organizations	3

Human Resource Management

PADM 651	Administrative Theory I: The Context of Public Administration	3
PADM 655	Theories of Public Organization	3
PADM 720	Public Personnel Administration	3
PADM 795	Advanced Topics in Public Personnel Administration	3

Public Policy

PADM/URBN 701	Public Policy Analysis & Evaluation	3
PADM 753/URBN 607	Research Methods (Pre-requisite is PADM/URBN 410 or waiver)	3
PADM/URBN 704	Methods of Program Evaluation	3
URBN 705	Urban Law and Public Policy	3

Public Budgeting and Finance

PADM 671	Public Budgeting and Financial Management	3
PADM 781	Intergovernmental Management	3
ECON 545	Urban Economics	3
ACCT 601	Accounting for Managers	3

General Public Sector Management

PADM 651	Administrative Theory I: The Context of Public Administration	3
PADM 603	The Environment of Public Administration	3
PADM 655	Theories of Public Organizations	3
PADM 733	Legal and Ethical Foundations of Public Administration	3

* Any alteration in course selection requires prior faculty advisor approval.

Business and Public Administration Affiliates

The college has several external units which enhance and support the academic programs. These units, listed below, offer opportunities for faculty members and students to interact with representatives of business, industry and government in Eastern Virginia.

Center for Asian Business. The Center for Asian Business has been established to enhance the college's capacity to teach and conduct research on the subjects related to Asian business practices. The center collects and disseminates information on Asian businesses, supports course offerings on Asian management, and publishes research monographs and articles on the subject. Also, the center provides managerial training and consulting services for Asian companies and executives.

The Center for Economic Education. The center is an integral part of the national effort dedicated to improving economic literacy and promoting a greater understanding of the free enterprise system. A nonpartisan, nonprofit organization, the center is an affiliate of the Virginia Council on Economic Education and the National Council on Economic Education. The center works cooperatively with school systems promoting increased effectiveness of economics instruction in grades K-12 through workshops, credit classes and consultations.

Executive Development Center. The center's mission is to provide businesses, organizations, and individuals with high quality professional development and continuing education programs in virtually all areas of business, management, and executive education. The center offers public programs for individuals seeking professional certificate programs, preparation for certification exams, career advancement and career change. In addition, the center develops and delivers custom training programs and consulting services to meet specific organizational and employee development needs of businesses and organizations regionally, nationally and internationally.

Regional Studies Institute. The primary objectives of the institute are to conduct research and develop a knowledge base on regional issues in the Eastern Virginia area. In addition, it provides a forum for regional collaboration involving educational, business, and government organizations.

Insurance and Financial Services Center. The Insurance and Financial Services Center supports undergraduate and graduate curricula in the disciplines of professional financial planning and risk and insurance. In addition, it provides for active involvement with the Eastern Virginia financial services community as a placement, research, consultative, and resource agency. The center further supports educational programs and seminars for the profession including a professional development program for practitioners that leads to the designation of Professional Financial Planner (PFP).

Maritime Institute. The mission of the institute is to provide world quality maritime, ports and logistics management education, training, and research to meet regional, national and international needs. The Maritime Institute serves as a positive catalyst for the delivery of education, training, research, and service programs, thus supporting the economic growth and international competitiveness of greater Hampton Roads and Virginia. Courses are available at both the undergraduate and graduate levels. Professional and executive-level seminars, workshops, and short courses will also be offered.

E.V. Williams Center for Real Estate and Economic Development. The mission of the center is to provide information and resources for the Hampton Roads real estate and economic development communities in their quest to improve the regional economy through job creation and investment. The center fosters relationships with the development community by hosting topical seminars on key development issues affecting the region and works closely with all related professional service organizations. The center maintains a comprehensive collection of information including detailed demographic and real estate data and employs the latest in geographic information and mapping software. The center publishes annual real estate market reviews on the office, industrial, retail, single family and multi-family real estate markets and sponsors the Hampton Roads Real Estate Market Review and Forecast.

**College of Business and Public Administration
Graduate Courses**

Course Prefixes

Accounting – ACCT
Business Admin – BUSN
Decision Sciences – DSCI
Economics – ECON
Finance – FIN
Information Technology - IT
Management - MGMT
Maritime Ports and Logistics Management –
PORT
Marketing – MKTG
Master of Business Admin – MBA
Operations Management – OPMT
Public Admin – PADM
Public Administration and Urban Policy —
PAUP
Taxation – TAX

Accounting — ACCT

ACCT 405/505. Accounting and Auditing in the Public/Nonprofit Sector. Lecture 3 hours; 3 credits. Prerequisites: ACCT 301 with a C or better, senior standing and admission to the Bachelor of Science in Business Administration or permission of the Associate Dean of the College of Business and Public Administration. Students must have a C- or better in ACCT 405 to graduate with a concentration in accounting. The application of accounting principles to governmental funds and not-for-profit organizations. Emphasis is placed on budgeting and control as well as auditing concerns for such entities.

ACCT 411/511. Financial Auditing. Lecture, case study, and discussion 3 hours; 3 credits. Prerequisites: ACCT 301 with a C or better, senior standing and admission to the Bachelor of Science in Business Administration or permission of the Associate Dean of the College of Business and Public Administration. Students must have a C- or better in ACCT 411 to graduate with a concentration in accounting. Standards and ethics of the public accounting profession, generally accepted auditing standards, and public reporting are covered, as well as exposure to other types of auditing such as operational and compliance auditing.

ACCT 421/521. Taxation. Lecture 3 hours; 3 credits. Prerequisites: ACCT 301 with a C or better, junior standing and admission to the Bachelor of Science in Business Administration or permission of the Associate Dean of the College of Business and Public Administration. Students must have a C- or better in ACCT 421 to graduate with a concentration in accounting. An analysis of federal income tax law and its application to personal and business tax situations. Reconciliation of tax and accounting concepts.

ACCT 422/522. Federal Income Taxation of Individuals and Business Entities. Lecture 3 hours; 3 credits. Prerequisite: ACCT 421/521, junior standing and admission to the Bachelor of Science in Business Administration or permission of the Associate Dean of the College of Business and Public Administration. Students must have a C- or better in ACCT 422 to graduate with a concentration in accounting. An analysis of federal income tax laws and its application to individuals and business entities.

ACCT 450/550. International and Advanced Accounting. Lecture 3 hours; 3 credits. Prerequisites: ACCT 301 with a C or better, ACCT 302, senior standing and admission to the

Bachelor of Science in Business Administration or permission of the Associate Dean of the College of Business and Public Administration. Students must have a C- or better in ACCT 450 to graduate with a concentration in accounting. The study of accounting for international operations and business combinations.

ACCT 601. Accounting for Managers. Lecture and discussion 3 hours; 3 credits. A study of the concepts of financial and managerial accounting. Covers the financial reporting process and the development of financial statements for external users while exposing students to internally generated accounting information. The overall objective of the course is to provide students with sufficient knowledge and competency to be intelligent users of accounting information.

ACCT 623. Operational Assurance Services. Lecture 3 hours; 3 credits. Prerequisite: ACCT 601 or equivalent. Standards, ethics, and practice of operational auditing particularly as it concerns the internal auditing profession, as well as exposure to financial auditing.

ACCT 624. Information Technology Assurance Services. Lecture and discussion 3 hours; 3 credits. Prerequisite: ACCT 601 or equivalent. Standards, ethics, and practice of information technology assurance services particularly as it concerns the governance and control of information systems. (cross listed with IT 624)

ACCT 625. Fraud Examination and Forensic Accounting. Lecture 3 hours; 3 credits. Prerequisite: ACCT 601 or equivalent. Standards, ethics, and practice of fraud examination and forensic accounting particularly as it concerns the accounting profession.

ACCT 626. Financial and Global Accounting. Lecture 3 hours; 3 credits. Prerequisite: ACCT 301 with a B- or better or equivalent. Course covers current financial accounting standards and the reporting problems faced by national and multinational corporations in reporting financial information to external users in a global economy. Discussion of the various techniques for presenting and analyzing financial statements and the ethical issues related to those presentations.

ACCT 627. Operational Cost Control. Lecture 3 hours; 3 credits. Prerequisite: ACCT 601 or equivalent. Covers cost concepts and analysis in both a manufacturing and service operational environment. Provides an introduction to activity based costing and standard cost systems, methodology for measuring productivity changes and cost of quality and measurement and control of operating performance.

ACCT 630. Financial Statement Analysis. Lecture 3 hours; 3 credits. Prerequisite: ACCT 301 with a B- or better or equivalent. This course covers the analysis and interpretation of financial statements, including the significant accounting issues involved in performing an effective evaluation of a company. Accounting and financial analysis are used to provide a framework for applying the various techniques for analyzing and interpreting financial statements.

ACCT 631. Advanced Financial Auditing. Lecture 3 hours; 3 credits. Prerequisite: ACCT 301 with a B- or better or equivalent. Advanced concepts associated with the public accounting profession, generally accepted auditing standards, public accounting reporting, and recent developments, such as Sarbanes-Oxley/Public Company Accounting Oversight Board, are emphasized.

ACCT 640. Professional Ethics and Legal Issues in Accounting. Lecture 3 hours; 3 credits. Prerequisite: ACCT 301 with a B- or better. An intensive course covering ethical and legal issues confronted by practicing accountants. The course emphasizes rigorous analysis of complex situations leading to appropriate ethical and legal solutions.

ACCT 667. Cooperative Education. 1-3 credits. Prerequisite: permission of the departmental chair in accordance with departmental Cooperative Education policies and approval of Career Management. Student participation in a full-time professional work experience.

ACCT 668. Accounting Internship. 1-3 credits. Prerequisite: permission of the departmental chair. The course is a practicum in the profession of accounting where theories, concepts, and financial management techniques are applied in a business environment.

ACCT 693. Selected Topics in Accounting. 3 credits. Prerequisites: permission of the chair of the Department of Accounting and the graduate program director, and an established B average in graduate work. Study designed for students who have had one of the required courses waived or for students desiring additional work in an area of particular interest in accounting.

ACCT 727. Strategic Cost Management. Lecture and discussion 3 hours; 3 credits. Prerequisite: ACCT 201-202, 301, 311 and 421 or equivalent courses, each with a B- or better. Focuses on advanced costing concepts, current management accounting practices, and analytical techniques employed by Controllers in supporting their organization's strategic planning process.

ACCT 747. Seminar in Controllorship. Lecture 3 hours; 3 credits. Prerequisite: ACCT 627 or equivalent. This course is the capstone course for the study of management accounting. It includes a review of management accounting practices and analytical techniques employed by controllers in supporting their organization's strategic decision-making process.

Business Administration — BUSN

BUSN 800. Seminar in International Business. Seminar 3 hours; 3 credits. This course will provide students with a comprehensive understanding of the environmental issues, institutions, opportunities, challenges, problems and managerial processes that are unique to international business. Both the micro and macro contexts in which international business is conducted will be examined.

BUSN 801. Research/Teaching Colloquium. 1 credit. The one-hour Research/Teaching Colloquium is mainly intended to promote research/teaching competencies of doctoral students through their exposure to presentations on and discussions of various topics dealing with research, writing, publishing and effective teaching. The presentations may be by faculty members, outside speakers or doctoral students.

Decision Sciences — See Information Systems and Technology/Decision Sciences

Economics — ECON

ECON 402/502. Transportation Economics. Lecture and discussion 3 hours; 3 credits. Prerequisites: ECON 202S (or 200S and permission of the instructor) and junior standing or permission of the chief departmental advisor. A

survey of the transportation system in the United States including its development, pricing, and regulation. Special attention is given to railroads, highways, pipeline, water and air transportation; and the roles that these modes of transportation play in economic development.

ECON 407/507. Labor Market Economics. Lecture and discussion 3 hours; 3 credits. Prerequisites: ECON 202S (or 200S and permission of the instructor) and junior standing or permission of the chief departmental advisor. Economic analysis of various facets of labor markets. Emphasis is placed on the analysis of labor supply, labor demand, wage determination, earnings differentials and inequality, occupational choice, human capital investment, labor market discrimination, mobility and immigration, impact of unions, and unemployment.

ECON 421/521. Public Economics. Lecture and discussion 3 hours; 3 credits. Prerequisites: ECON 201S, 202S and junior standing or permission of the chief departmental advisor. This course examines the interaction between government and the economy, with particular emphasis on the role of the federal government. Topics that address the motivation for government involvement in the economy include market failure, income inequality, and redistribution of income. Specific programs studied include Medicare/Medicaid, welfare programs, and the social security system.

ECON 425/525. Introduction to Mathematical Economics. Lecture and discussion 3 hours; 3 credits. Prerequisites: ECON 201S, 202S, MATH 200 or equivalent and senior standing or permission of the chief departmental advisor. The course focus is on the use of differential and integral calculus, matrix algebra, difference equations and classical optimization theory in the presentation and development of economic theory.

ECON 427/527. Industrial Organization and Public Policy. Lecture and discussion 3 hours; 3 credits. Prerequisites: MATH 200 or equivalent, ECON 202S (or 200S and permission of the instructor) and junior standing or permission of the chief departmental advisor. A study of market structures and the conduct and performance of business firms in different market structures. The emphasis is on the theory and measurement of industrial concentration and public policy responses to industrial concentration.

ECON 431/531. Money and Banking. Lecture and discussion 3 hours; 3 credits. Prerequisites: ECON 201S, 202S and junior standing or permission of the chief departmental advisor. Examines the nature and functions of money and credit, the commercial banking system, the Federal Reserve System, the quantity theory of money, the theory of income determination, the balance of payments and exchange rates, and the history of monetary policy in the United States.

ECON 435/535. Health Economics: A Global Perspective. Lecture 3 hours; 3 credits. Prerequisite: ECON 202S. This course introduces the student to the economics of health care and the application of health economics to health care problems, the issues surrounding those problems, and the potential solutions to those problems. The course will emphasize institutional features of the health care industry, the market for health care, the political economy of health care, and government involvement in the delivery of health care. Further, the course will survey the delivery of health care in other countries and provide a global perspective on selected health care issues such as

AIDS, water and air quality, and the aging of the population.

ECON 444/544. Development of the American Economy. Lecture and discussion 3 hours; 3 credits. Prerequisites: ECON 201S, 202S and junior standing or permission of the chief departmental advisor. A study of the economic development of the United States from colonial times to the present. An analytical course concerned with the application of economic theory in the study of the growth and development of the American economy.

ECON 445/545. Urban Economics. Lecture and discussion 3 hours; 3 credits. Prerequisites: ECON 202S (or 200S and permission of the instructor) and junior standing or permission of the chief departmental advisor. An analysis of the economic factors which give rise to the formation of urban centers and which contribute to the following problems: urban poverty, housing conditions, traffic congestion, and the fiscal crisis faced by modern cities.

ECON 447/547. Natural Resource and Environmental Economics. Lecture 3 hours; 3 credits. Prerequisites: ECON 202S (or 200S and permission of the instructor) and junior standing or permission of the chief departmental advisor. Topics discussed include conservation and scarcity, market failure, fishery management, benefit-cost analysis, water resource development, environmental quality, recreation, energy, and marine resources.

ECON 451/551. History of Economic Thought. Lecture and discussion 3 hours; 3 credits. Prerequisites: ECON 201S (or 200S) and 202S and junior standing or permission of the chief departmental advisor. A study of the history of economic theory with attention to the economic ideas and philosophy of Adam Smith, David Ricardo, Karl Marx, J.M. Keynes and other major figures in the development of economics.

ECON 454W/554. Economic Development. Lecture 3 hours; 3 credits. Prerequisites: ECON 201S and 202S. This course is intended to provide an introduction to the problems of economic development in the Third World, including the problems of economic growth, income distribution, poverty, urbanization, uneven development, agricultural policy, economic planning, industrial policy, trade policy, balance of payments, finance, and currency crises. To illustrate these issues we will examine the problems of certain individual countries, such as Brazil, Korea, Philippines, India, Mexico, Kenya, Indonesia, and Thailand. In the course we try to strike a balance between economic theory and institutional economics.

ECON 455/555. Comparative Economic Systems. Lecture and discussion 3 hours; 3 credits. Prerequisites: ECON 201S, 202S and junior standing or permission of the chief departmental advisor. This course examines and compares different economies from around the world, including such economies as the UK, France, Germany, Sweden, Japan, India, Korea, Russia, and China. Students look at the economic growth, GDP per capita, unemployment, inflation, income distribution, economic efficiency, institutions, policies, industrial structure, legal infrastructure, and international trade of these economies. Students study the functioning of markets and the problems of market and government failure. The course addresses the question, what is the best way to organize society?

ECON 456/556. Economics of Information, the Internet and E-Commerce. Lecture and laboratory 3 hours; 3 credits. Prerequisites:

ECON 201S, 202S and junior standing or permission of instructor. Outlines the economic principles of information that underpin the Internet and e-commerce. Considers auctions, economies of scale and scope, data mining, price discrimination, product bundling, versioning, networking, the diffusion of innovations and intellectual property as they are utilized on the Internet and in e-commerce. Taught in a microcomputer laboratory.

ECON 495/595. Selected Topics in Economics. 1-3 credits. Prerequisites for 495: ECON 201S and 202S, and permission of the instructor. Prerequisite for 595: permission of the instructor. Taught on an occasional basis. A study of selected topics, the title of which will appear in the course schedule.

ECON 604. Managerial Economics and International Trade. Lecture 3 hours; 3 credits. (Credit may not be applied toward the M.A. in economics) Corequisite: DSCI 600 or URBN 606. Prerequisite: MATH 200 or equivalent. Demand and supply, theory of optimizing behavior, demand elasticity, demand forecasting, production, costs, pricing with market power, multiple plants, markets and products, profit maximization, uncertainty, international trade and tariffs.

ECON 612. Global and Applied Macroeconomics. Lecture 3 hours; 3 credits. Prerequisite: ECON 604 or permission of instructor. (Credit may not be applied toward the M.A. in economics) Measurements and indicators of economic activity; short-run macroeconomic analysis, credit markets, demand for money, institutional factors in money and banking, money creation, and monetary policy, long-run macroeconomics, short-run macroeconomic comparative statics, foreign exchange markets; description and history of business cycles, inflation, economic growth and public policies.

ECON 625. Mathematical Economics. Lecture 3 hours; 3 credits. Prerequisite: MATH 200 or equivalent; ECON 604; ECON 612; or ECON 650. This course focuses on the use of mathematical techniques in solving complex economic problems. Primary emphasis is given to matrix algebra, differential calculus, constrained optimization techniques and dynamic optimization techniques.

ECON 650. International Economics. Lecture and discussion 3 hours; 3 credits. (Credit may not be applied toward the M.A. in economics.) Prerequisites: ECON 201S or 202S and graduate standing. An analysis of international trade theory, commercial policy, foreign exchange markets, open economy macroeconomics, and balance of payments. The course provides the theoretical basis to understand contemporary international economic issues.

ECON 668. Economics Internship. 3 credits. Prerequisites: 12 hours of economics and permission of the graduate program director. The course is a practicum in the field of economics applying theories, concepts, and quantitative tools in a professional environment.

ECON 695. Selected Topics in Economics. 1-3 credits. For school teachers only. Credit may not be applied toward the M.A. in economics or the M.B.A.

ECON 697. Readings in Economics. 3 credits. Individual readings in a selected field under the direction of a faculty member of the department.

ECON 698. Economic Methodology and Research. 3 credits. Individual research under the direction of a faculty member of the department.

ECON 699. Thesis. 6 credits.

ECON 701/801. Advanced Economic Analysis: Microeconomics. Lecture 3 hours; 3 credits. Corequisite: ECON 625. Prerequisite: ECON 604 or equivalent. Concepts and techniques of modern microeconomic theory, development in the theory of utility and demand, theory of the firm and market, partial and general equilibrium analysis.

ECON 703/803. Advanced Economic Analysis: Macroeconomics. Lecture 3 hours; 3 credits. Corequisite: ECON 625. Prerequisite: ECON 612 or equivalent. Study of income, employment, the price level, money, and the effect of government policy under static and dynamic conditions. Mainstream and alternative theories considered.

ECON 706/806. Econometrics I. Lecture 3 hours; 3 credits. Corequisite: ECON 625. Prerequisites: ECON 604 or equivalent and 612 or equivalent. Single-equation econometric models; serial correlation, heteroscedasticity, specification error, missing observations, and errors-in-variables and forecasting.

ECON 707/807. Econometrics II. Lecture 3 hours; 3 credits. Prerequisite: ECON 706/806. Multi-equation econometric models; problems such as identification, single-equation estimation, estimation of equation systems, and model evaluation techniques; time-series models such as autoregressive and moving average models; forecasting with time-series models.

ECON 708/808. Econometrics III. Lecture 3 hours; 3 credits. Prerequisite: ECON 707/807. Issues in cross-section and panel data, focuses on problems such as selection bias, heterogeneity, unobserved heterogeneity, treatment effects, truncation and censoring. The course covers multivariate techniques such as principal component analysis and factor analysis, along with event studies and nonparametric and semiparametric estimators.

ECON 752/852. International Trade. Lecture 3 hours; 3 credits. Prerequisite: ECON 604 or 650 or equivalent. Pure theory of international trade, mathematical models of trade, instruments of trade policy, theory and practice of economic integration, trade liberalization issues from international and regional viewpoints.

ECON 753/853. International Finance. Lecture 3 hours; 3 credits. Prerequisite: ECON 612 or 650 or equivalent. International capital flows, exchange rates and price level, income, money supplies, inflation, international liquidity, causes of international balance and imbalance, balance-of-payments adjustments. Monetary magnitudes as a basis for insight into international financial policies.

ECON 754/854. Economic Development. Lecture 3 hours; 3 credits. Prerequisite: ECON 304 or 604 or 650. Introduction to the problems of economic development in the third world, including the problems of economic growth, income distribution, poverty, urbanization, uneven development, agricultural policy, economic planning, industrial policy, trade policy, balance of payments, finance, and currency crises.

ECON 795/895. Selected Topics in Economics. 3 hours; 3 credits. Prerequisites: Ph.D. standing and permission of the chair and coordinator. Designed to provide the advanced student with an opportunity to study independently

or in small groups and investigate specific topics of current interest in the field of economics.

Finance — FIN

FIN 605. Financial Management. Lecture 3 hours; 3 credits. Prerequisite: ACCT 601 and DSCI 600. The course develops basic concepts of shareholders wealth maximization, net present value, security valuation, risk-return analysis, capital budgeting, cost of capital, capital structure, and dividend policy.

FIN 610. Principles of Risk and Insurance. Lecture and discussion 3 hours; 3 credits. Prerequisites: graduate standing and permission of the graduate program director. Risk theory as applied to the various fields of insurance, including life, health, property-liability and employee benefits.

FIN 633. The Legal Environment of Business and the Age of Electronic Commerce. Prerequisite: graduate standing. An understanding of the traditional legal environment of business issues is essential for management to successively utilize e-commerce and respond to legal problems that it will present. The course therefore examines dispute resolution, constitutional, tort, criminal, contract and property law, both in the context of traditional business practice and as applied to e-commerce.

FIN 668. Finance Internship. 1-3 credits. Prerequisites: FIN 605, graduate standing, and permission of the department chair. The course is a practicum in the field of finance, applying theories, concepts, and financial management tools in a business environment.

FIN 697. Selected Topics in Finance. 1-3 hours; 1-3 credits. Prerequisites: permission from the department chair and the graduate program director. Study designed for students who have had one or more of the required courses waived, or for students desiring additional work in a finance area of particular interest.

FIN 698. Selected Topics in Real Estate. 3 hours; 3 credits. Prerequisites: permission from the department chair and the graduate program director. Study designed for students who have had one or more of the required courses waived, or for students desiring additional work in a finance area of particular interest.

FIN 699. Selected Topics in Insurance. 3 hours; 3 credits. Prerequisites: permission from the department chair and the graduate program director. Study designed for students who have had one or more of the required courses waived, or for students desiring additional work in an insurance area of particular interest.

FIN 735/835. Portfolio Analysis. Lecture and discussion 3 hours; 3 credits. Prerequisite: FIN 605. A mathematical analysis of modern investment theory. Analyzes return and risk characteristics of individual securities and portfolios and develops valuation models of various financial instruments.

FIN 737/837. International Financial Management. Lecture and discussion 3 hours; 3 credits. Prerequisite: FIN 605. Examines such topics as the financial aspects of international business including financing and hedging activities of firms involved in international transfer of goods and services and decision making in connection with the asset management financing activities of multinational corporations.

FIN 740. Futures and Options. Lecture 3 hours; 3 credits. Prerequisite: FIN 605. In no area of finance is the interface between academic theory and real-world practice as close as in the case of

futures and options. We have now reached a stage where it is essential that all finance professionals understand how these markets work, how they can be used, and what determines prices in them. This course addresses all these issues.

FIN 741. Corporate Financial Policy and Control. Lecture 3 hours; 3 credits. Prerequisite: FIN 605. The course will comprise mainly cases but there will be some lecturing particularly on material not covered in FIN 605.

FIN 795/895. Selected Topics in Finance. 3 hours; 3 credits. Prerequisites: Ph.D. standing and permission of the chair and coordinator. Designed to provide the advanced student with an opportunity to study independently or in small groups and investigate specific topics of current interest in the field of finance.

FIN 860. Seminar in Financial Theory. Seminar 3 hours; 3 credits. Prerequisite: FIN 738/838. This course discusses the building blocks which much of financial theory is based on. In addition, a number of current topics in the literature are analyzed. Students are expected to read many of the original journal articles.

FIN 861. Seminar in Investments. Seminar 3 hours; 3 credits. Prerequisites: FIN 737/837. The purpose of this course is to be acquainted with recent theoretical and empirical literature on investments, portfolio management and speculative instruments. Emphasis will be placed on the development of methodological approaches to the various research problems.

FIN 862. Seminar in International Finance. Seminar 3 hours; 3 credits. Prerequisites: FIN 737/837. This course is designed to provide an in-depth understanding of the key issues of international financial management. Topics covered include balance of payments, interest rates, international capital flows/markets and asset pricing, foreign exchange risk management, and international capital budgeting.

FIN 863. Seminar in Current Financial Topics. Seminar 3 hours; 3 credits. Prerequisites: FIN 737/837, and 735/835. This course is structured to provide the student with research developments that lie on the frontier of corporate financial management. Topics covered include optimal investment and financing decisions, cost of capital, option pricing theory, equilibrium valuation models, efficient capital markets, capital structure, dividend policy, mergers and acquisitions and international financial management.

FIN 864. Directed Research Seminar. 3-6 credits. A directed reading and study course of advanced developments in the field of finance.

FIN 899. Dissertation. 1-12 credits. Prerequisite: FIN 863. An approved research project, written under the supervision of a faculty advisor, in which the student demonstrates the ability to conduct original research. The complete project must be approved by the dissertation committee.

Information Technology/Decision Sciences

Decision Sciences — DSCI

DSCI 407/507. Management Science. Lecture and discussion 3 hours; 3 credits. Prerequisites: DSCI 306, junior standing and admission to the Bachelor of Science in Business Administration or permission of the associate dean of the College of Business and Public Administration for DSCI 407 and OPMT 611 for DSCI 507 or permission of the instructor. Formulation and solution of mathematical models and their uses and limitations

in business. Topics include linear, integer, and goal programming, network models, queuing, utility theory, and Markov analysis. Cases and computer solution of topics introduced in this class, as well as topics from DSCI 206 and 306, are incorporated.

DSCI 432/532. Forecasting and Quality Management Systems. Lecture and discussion 3 hours; 3 credits. Prerequisites: OPMT 303T and DSCI 306 and admission to the Bachelor of Science in Business Administration or permission of the associate dean of the College of Business and Public Administration for DSCI 432 and OPMT 611 for 532. Forecasting systems for both service and manufacturing organizations. Study of technological issues in designing, planning, and operating quality control systems. Computer software will be utilized throughout the course.

DSCI 476/576. Simulation Modeling and Analysis for Business Systems. Lecture 3 hours; 3 credits. Prerequisites: OPMT 303T, DSCI 306, senior standing and admission to the Bachelor of Science in Business Administration or permission of the associate dean of the College of Business and Public Administration. Methods and techniques of digital computer simulation of business systems utilizing knowledge of data processing, statistics, probability theory and operations research. Areas of application include systems that experience waiting problems. Topics include the methodology for the construction of computer simulation models, model verification, validation, and analysis of results. This course also includes a CAP experience. (qualifies as a CAP experience)

DSCI 600. Foundations of Statistics for Business and Economics. Lecture and discussion 3 hours; 3 credits. Descriptive statistics, probability and probability distributions, estimation and hypothesis testing, analysis of variance, simple and multiple regression, and introduction to times series analysis. Computer software, as a tool for problem solving, will be utilized throughout the course. Emphasis is on the interpretation, in a business context, of statistical information for both simple and complex models.

DSCI 641. Electronic Supply Chain Management. Lecture 3 hours; 3 credits. Prerequisite: OPMT 611 or permission of the instructor. Supply chain management (SCM) is the integration of the activities associated with directing the flow of information and materials required to create product package, in order to achieve sustainable competitive advantage, from the raw materials stage through to the end user. This course focuses on improving supply chain relationships through effective integration of management and electronic SCM via such technologies as the World Wide Web, electronic data interchange, enterprise resource planning (ERP), and electronic funds transfer (EFT). (cross-listed with MSCM 641)

DSCI 667. Cooperative Education. 1-3 credits. Approval for enrollment and allowable credits are determined by the department and Career Management in the semester prior to enrollment.

DSCI 668. Decision Sciences Internship. 1-3 credits. Approval for enrollment and allowable credits are determined by the department and Career Management in the semester prior to enrollment.

DSCI 695. Selected Topics in Decision Sciences. 3 credits. Prerequisite: permission of the department chair and graduate program director.

DSCI 697. Independent Study in Decision Sciences. 3 credits. Prerequisite: OPMT 611. Affords students the opportunity to undertake independent study under the direction of a faculty member.

DSCI 700. Linear Methods for Business Decisions. Lecture 1 hour; 1 credit. An introduction to matrix algebra and optimization with emphasis on those techniques necessary for mathematical analysis of advanced statistical models used in business research. Applications of use of matrix algebra for analyzing statistical models are discussed throughout the course.

DSCI 711. Multivariate Statistical Methods for Business. Lecture and discussion 3 hours; 3 credits. Prerequisite: DSCI 600 or permission of the instructor. An applied study of statistical methods including analysis of variance, ANCOVA, multiple regression and exploratory factor analysis. Data analyzed using a computerized statistical package. Emphasizes development of the student's ability to use statistics for independent research.

DSCI 712. Advanced Statistical Models in Business Research. Lecture and discussion 3 hours; 3 credits. Prerequisite: DSCI 711. Advanced statistical models that are commonly encountered in business research. Topics include confirmatory factor analysis as well as structural equation modeling. Emphasis is on model development as well as use of statistical software in analyzing realistic business-oriented data sets.

DSCI 721/821. Simulation Modeling for Business Systems. Lecture 3 hours; 3 credits. Prerequisite: MSIM 601 or 611 or DSCI 476 or 576. This course covers both the theory and application of simulation modeling and analysis to business systems. Both discrete-event and continuous simulation modeling approaches are covered, using a major commercial simulation package. Emphasis will be on the use of simulation as research tool.

DSCI 722/822. Agent-Based Simulation and Modeling. Lecture 3 hours; 3 credits. Prerequisites: MSIM 601 or 611 or DSCI 576 or 721 or 821. This course will explore both the conceptual and technical aspects of agent-based simulation, particularly as utilized for modeling of business systems. Students will explore the roots and literature of agent-based modeling and related fields. Students will also learn to develop agent-based simulation models using a major commercial simulation package.

DSCI 813. Fundamentals of Survey Research. Lecture 3 hours; 3 credits. Prerequisite: DSCI 711. This course focuses on the fundamental issues associated with survey research as found in the marketing/management disciplines. The topics covered are experimental and quasi-experimental designs, analysis of data from experimental designs, questionnaire design and refinement, and scale development. (cross-listed with MKTG 713/813)

Information Technology — IT

IT 430/530. Object-Oriented Programming with JAVA. Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 310 or CS 250 and admission to the Bachelor of Science in Business Administration or permission of the associate dean of the College of Business and Public Administration. An introduction to JAVA as an object-oriented language used to write JAVA applets and applications. Business examples incorporating multimedia, multithreading, networking, and advanced graphical interfaces are used to reinforce the object-oriented concepts of

abstraction, encapsulation, inheritance, polymorphism, persistence, and dynamic binding.

IT 610. Information Technology Management. Lecture 3 hours; 3 credits. Information is a critical resource for today's organizations. This course prepares students for the managerial, organizational and technological challenges involved on managing information and information technology resources.

IT 612. Knowledge Management. Lecture and discussion 3 hours; 3 credits. Prerequisites: IT 610 or equivalent; This course covers theory and practice of managing knowledge in organizations. Knowledge processes including knowledge creation, acquisition, transfer and application are studied. Students are introduced to real-world technologies and systems.

IT 620. Systems Analysis and Design. Lecture 3 hours; 3 credits. Prerequisite: IT 610 or equivalent; or permission of the department. Introduction to the Systems Development Life Cycle (SDLC) from an information systems project perspective. Emphasis is placed on the planning and analysis functions performed during information systems project work. Tools and techniques include: Data flow diagrams, Entity relationship diagrams, Computer-aided systems engineering (CASE), and the Project repository. These tools will be employed to create process and data-driven versions of these models.

IT 624. Information Technology Assurance Services. Lecture and discussion 3 hours; 3 credits. Prerequisite: ACCT 601 or equivalent. Standards, ethics, and practice of information technology assurance services particularly as it concerns the governance and control of information systems. (cross listed with ACCT 624)

IT 625. Information Systems for International Business. Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 610 or equivalent; or permission of the department. Examines the role of information in the global environment and the global organization. Issues related to information infrastructures for the organization, nation and the world will be covered, as well as how global information systems departments support the organization.

IT 635. Telecommunication and E-Commerce. Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 620 or equivalent; or permission of the department. Examines the impact of electronic commerce and telecommunications in the global business environment. A comprehensive introduction to the use of the Internet to effectively exploit the Internet's resources for business applications.

IT 649. Information Systems and Network Security. Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 635 or permission of the department. Introduces the fundamental issues and concepts of information security, emphasizing security policy, risk management, cryptography and network security.

IT 650. Database Management Systems. Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 620 or equivalent; or permission of the department. Introduction to database management systems. The topics addressed include system architecture, data models, database analysis, design and implementation, query processing, business transaction processing, and database security.

IT 651. Data Warehousing and Mining. Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 650 or permission of the

department. Introduction to data warehousing and mining. Examines techniques used to extract data patterns and relationships from various operational and historical data.

IT 652. On-Line Analytical Processing (OLAP). Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 650 or permission of the department. Introduction to On-Line Analytical Processing and the use of multidimensional techniques and tools to extract information from data warehouses and marts.

IT 660. Enterprise Information Systems. Lecture 3 hours; 3 credits. Prerequisite: IT 650. This course covers the organizational design and implementation of enterprise information systems based on large ERP software packages. Software engineering issues specific to packaged software such as software customization, upgrade, localization, extension and integration are explored. Students are exposed to real-world technologies and systems.

IT 661. Implementing Internet Applications. Lecture and discussion 3 hours; 3 credits. Prerequisites: IT 610 or equivalent; prior programming experience; or permission of the department. Advanced design and implementation strategies are utilized to create dynamic e-commerce applications. Key concepts include: Internet architecture, structured data languages, scripting languages, programming languages, database connectivity, and Internet security.

IT 664. Project Management in IT. Lecture 3 hours; 3 credits. Prerequisite: IT 620 or equivalent, or permission of the department. This course provides basic knowledge of project management including tools to manage scope, time, cost, quality, risk, team, communications and procurement. Special issues in the IT context are emphasized.

IT 665. Network and Information Systems Administration. Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 635 or permission of the department. Managing information and network systems as a corporate resource. Topics include: project management, end-user support, managing operations, control and audit services, capacity planning and acquisition of hardware, software and services.

IT 667. Cooperative Education. 1-3 credits. Prerequisite: IT 620 or equivalent. Approval for enrollment and allowable credits are determined by the department and Career Management in the semester prior to enrollment.

IT 668. Information Systems Internship. 1-3 credits. Prerequisite: IT 620 or equivalent. Approval for enrollment and allowable credits are determined by the department and Career Management in the semester prior to enrollment. Available for pass/fail grading only.

IT 672. Information Architectures. Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 650 or permission of the department. Modeling of information architectures for business. High-level modeling methodologies. Implications for database and object data management.

IT 674. Managing IT Strategically. Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 620 or equivalent, or permission of the department. Focuses on improving business use of existing IT and managing for competitive advantage. Prepares IT students for executive positions in IT including CIO. Non-IT students benefit by gaining a strategic perspective on an important organizational resource – information.

IT 695. Selected Topics in Information Systems. 3 credits. Prerequisite: permission of the

department chair and the graduate program director.

IT 697. Independent Study in Information Systems. 1-3 credits. Prerequisite: IT 650 or permission of the department. Affords students the opportunity to undertake independent study under the direction of a faculty member.

IT 698. Master's Project in Information Systems. 3 credits. Prerequisites: IT 650 and permission of the department.

IT 699. Master's Thesis in Information Systems. 1-6 credits. Prerequisites: IT 650 and permission of the department.

IT 795/895. Selected Topics in Management Information Systems. 3 credits. Prerequisite: permission of the department chair and the graduate program director.

IT 800. Theoretical Foundations in ISR. Lecture 3 hours; 3 credits. A survey of research methodology in business information technology research including empirical, behavioral and computational approaches in different types of problem domains. The approach will be interdisciplinary.

IT 850. Enterprise Architecture. Lecture 3 hours; 3 credits. Prerequisite: IT 800. This course examines the latest advances in enterprise architecture and computing. Topics include enterprise architecture design and modeling, service-oriented architecture (SOA), and integration of enterprise information and applications.

IT 890. Seminar in Business Process. Lecture 3 hours; 3 credits. Prerequisite: IT 800. This course discusses how firms achieve business excellence through business process management (BPM), business process improvement (BPI), and business process reengineering (BPR) supported by IT. Topics include business process and workflow modeling, analysis, integration, monitoring and management.

IT 891. Seminar in Business Intelligence. Lecture 3 hours; 3 credits. Prerequisites: IT 800. The objective of this course is to provide an overview of managerial and technical issues associated with business intelligence. Topics covered include the state-of-the art data warehousing, data mining and OLAP technologies.

IT 892. Seminar in Knowledge Management. Lecture 3 hours; 3 credits. Prerequisites: IT 800. The course examines the latest advances in knowledge management (KM) including identifying, capturing, sharing and evaluating an enterprise's knowledge assets. The course reviews and discusses existing technologies in KM and new emerging KM technologies and practices.

IT 893. Seminar in Supply Chain in E-Business. Lecture 3 hours; 3 credits. Prerequisites: IT 800. This course examines the development of information technologies related to supply chain management in a global e-business environment. Topics include managing material flow processes, maritime, logistics, procurement, inventory and distribution.

Management — MGMT

MGMT 413/513. Compensation Management. Lecture and discussion 3 hours; 3 credits. Prerequisite: senior standing and MGMT 340 or 602 or permission of the chief departmental advisor. A study of wage theory, practice and problems. Topics include compensation theory, job analysis, job evaluation, wage surveys, incentive plans, benefit programs and special features of compensation for sales, managerial, professional, and public employees.

MGMT 417/517. Employment Law. Lecture and discussion 3 hours; 3 credits. Prerequisite: junior standing and MGMT 325 or 602 or permission of the chief departmental advisor. An analysis of how the federal and state governments may regulate the employer-employee relationship. Topics include labor relations law, equal employment opportunity law, other current statutory employment law and common law employment issues.

MGMT 452/552. Organization Development. Lecture and discussion 3 hours; 3 credits. Prerequisites: MGMT 325 and 451 or 602 and senior standing or permission of the chief departmental advisor. Applications of organizational development theory and processes. Topics include OD Theory, role of change agent, intervention processes, the consulting process, and design and implementation of OD change programs.

MGMT 463/563. Management Seminar Abroad. Lecture and discussion 3 hours; 3 credits. Prerequisite: permission of the chief departmental advisor. A study tour abroad under the direction of a faculty member including on-site visits and management lectures designed to provide insight into differences in management practices in foreign countries. Offered summers only and when available.

MGMT 602. Organizational Management. Lecture 3 hours; 3 credits. Examine issues and principles in the management of individuals, groups, and organizations. Topics include motivation and reward systems, groups dynamics and team building organization design and change.

MGMT 618. Issues in Human Resource Management. Lecture 3 hours; 3 credits. Prerequisite: MGMT 602 or permission of the instructor. An analysis and evaluation of current human resource practices and problems. Examines topics such as human resource planning, selection, development, and compensation.

MGMT 630. Motivation and Leadership. Lecture 3 hours; 3 credits. Prerequisite: MGMT 602 or permission of the instructor. This course addresses how managers and organizations can enhance employee productivity and job satisfaction in a competitive global environment. Both the theories and practices of motivation and leadership will be examined.

MGMT 668. Management Internship. 1-3 credits. Prerequisites: MGMT 602, graduate standing and permission of the department chair. This course is a practicum in management, applying theories, concepts, and management techniques in a business setting.

MGMT 695. Selected Topics in Management. 1-3 credits. Prerequisite: permission of the department chair and the graduate program director. Study designed for students who have one or more of the required courses waived, or for students desiring additional work in an area of particular interest in management.

MGMT 721/821. International Strategic Management. Lecture 3 hours; 3 credits. Prerequisite: MGMT 710 or BUSN 800 or permission of the instructor. This course deals with various strategic options available to businesses operating in an international environment. It explores the literature and case materials on multinational companies and the theories and concepts relevant to the analysis of international strategic decisions.

MGMT 750. Business Policy and Strategy. Lecture 3 hours; 3 credits. Prerequisite:

permission of the graduate program director. A capstone integrative course on strategy formulation and implementation.

MGMT 830. Strategic Human Resource Management. Lecture 3 hours; 3 credits. The course examines strategic issues in human resource management. The course will examine how strategies and policies in areas such as recruitment, selection, training, career development, performance management and international human resource management influence firm performance. Other topics of current research may also be included.

MGMT 835. Organization Theory. Lecture 3 hours; 3 credits. This course examines theories and empirical research on organizations and their environment. Topics would include organization design, structure, decision making, change and adaptation. Other topics of current research may also be included.

MGMT 840. Strategy Classics. Lecture 3 hours; 3 credits. This course covers the classic texts and papers in the field of strategic management. This course will also include a discussion of the great debates within the field.

MGMT 842. Strategy Content Research. Lecture 3 hours; 3 credits. Prerequisite: MGMT 835 and 840 or departmental approval. This course focuses on research on strategy formation. Topics include business and corporate strategy, competitive dynamics, environmental analysis, resource based view, and strategic groups. Other topics of current research may also be included.

MGMT 890. Advanced Topics in Strategy. Lecture 3 hours; 3 credits. Prerequisites: MGMT 840 and 842. This course critically evaluates the classical debates and viewpoints within strategic management research. In addition the course would cover the emerging theoretical and methodological areas in strategic management research. Finally, the course would review in depth the research on contemporary issues in strategy. The objective of the course is to enable students to become independent scholars in the area of strategic management.

MGMT 896. Selected Topics in Management. Lecture 3 hours; 3 credits. Prerequisite: MGMT 840. Advanced study in selected topics in management planning, strategy and policy under the direction of one or more faculty in the Management Department.

MGMT 899. Dissertation. 1-9 credits. Ph.D.-level research and writing of dissertation.

MGMT 999. Management 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Maritime, Ports and Logistics Management — PORT

PORT 610. International Shipping and Supply Chain Management. Lecture 3 hours; 3 credits. Examines international freight transportation and terms for movement of international trade; focuses on improving supply chain relationships in the movement of international trade/directing the flow of information, materials and products. (cross-listed with MSCM 610)

PORT 611. International Maritime Transport. Lecture 3 hours; 3 credits. Prerequisites: an undergraduate course in the

international field such as MGMT 361, MGMT 462, or a similar graduate course. Examines the international business of shipping, commercial processes, maritime-related organizations, shipbuilding and repair, ship types and fleets, and commodity movement.

PORT 612. Port Operations and Management. Lecture 3 hours; 3 credits. Prerequisites: an undergraduate or graduate course in management such as MGMT 325 or 602 and a course in operations management like OPMT 303T. Covers role, functions, and types of international terminals and ports, including design and operation of general and specialized cargo handling facilities and offshore systems, port authorities, operational structures, and labor.

PORT 613. International Maritime and Admiralty Law. Lecture 3 hours; 3 credits. Prerequisite: a basic law course such as FIN 331 or 332. International law of the sea, maritime jurisdiction, regulation of shipping, carriage of goods, marine insurance, salvage, marine environmental law, safety at sea, and the Oil Pollution Act of 1990 are covered, along with other maritime laws.

PORT 614. Port Planning and Economics. Lecture 3 hours; 3 credits. Prerequisite: an undergraduate or graduate course in microeconomics such as ECON 304 or 604. Port planning and competition, ports and ocean container shipping, port impacts, port users in theory, port operator costing and pricing, port carriers and shippers, government and maritime institutions, dockworkers, port environment and port performance evaluation.

PORT 668. Directed Research/Port Internship. 1-3 credits. Prerequisites: PORT 611, 612, 613, and 614. Practical field experience in international maritime, ports and logistics related challenges through supervised investigation and analysis of a problem or a working internship within the port-related arena.

PORT 695. Selected Topics in Maritime and Port Management. 3 credits. Prerequisites: PORT 611 or 612. The advanced study of selected topics not offered on a regular basis.

PORT 697. Independent Study. 3 credits. Designed to provide the opportunity for independent study under the guidance of a member of the faculty.

Maritime and Supply Chain Management — MSCM

MSCM 430/530. Strategic Sourcing and Purchasing Management. Lecture 3 hours; 3 credits. Prerequisites: ACCT 202, DSCI 206, and OPMT 303T for 430 and ACCT 601 and OPMT 611 for 530. An overview of the strategic sourcing of materials and services in the organization and its role in the supply chain. Topics include sourcing decisions, price/cost analysis, quality issues, purchasing, supplier selection, legal and ethical issues, third party logistics, freight forwarding, and acquisition of services and capital assets.

MSCM 610. International Shipping and Supply Chain Management. Lecture 3 hours; 3 credits. Examines international freight transportation and terms for movement of international trade; focuses on improving supply chain relationships in the movement of international trade/directing the flow of information, materials and products. (cross-listed with PORT 610)

MSCM 641. Supply Chain Management and Logistics. Lecture 3 hours; 3 credits. Prerequisite: DSCI 611. Supply chain management integrates

all activities associated with the flow of materials and information from product start to customers. Examples include order processing, warehousing, inventory management, transportation and logistics, and the costs and information systems supporting these activities. Particular application is made to global logistics systems supporting port and maritime activities. Supply chain relationships can be improved through effective integration of management and via such technologies as the World Wide Web, electronic data exchange, and enterprise resource planning (ERP). (cross-listed with DSCI 641)

Marketing — MKTG

MKTG 603. Marketing Management. Lecture and discussion 3 hours; 3 credits. Fundamentals of marketing (including market research, product design, distribution, pricing and promotion of goods, services, people, places and ideas) with case analyses to clarify applications.

MKTG 621. Managerial Problems in Marketing Strategy. Lecture 3 hours; 3 credits. Prerequisite: MKTG 603 or permission of instructor. Lecture, case analysis and discussion of marketing from the business executive's viewpoint. Recent developments in marketing and related disciplines and their application in management. Readings, case analysis, discussion.

MKTG 625. Marketing Research Methods and Analysis. Lecture 3 hours; 3 credits. Prerequisites: MKTG 603 and DSCI 600 or permission of instructor. Examines the various methods of marketing research design. Covers experimental methods, sampling procedures, measurement techniques, and other methodological problems in marketing research. The student is introduced to data analysis and statistical modeling programs.

MKTG 628. Marketing of Services. Lecture 3 hours; 3 credits. Prerequisite: MKTG 603 or permission of instructor. This course examines the application of marketing principles and techniques to service organizations. Topics covered include the nature of services, distribution, and promotion considerations. Class discussion revolves around a textbook, cases, and outside readings. Students take part in a major group project which will involve the development of a marketing plan for a service organization.

MKTG 630. Ethics and Marketing Decision-Making. Lecture 3 hours; 3 credits. Prerequisite: MKTG 603 or permission of instructor. Marketers, probably more than other professionals, often are faced with decisions involving an ethical issue. This course has the following objectives: 1) to examine the ethical decision-making process of marketing professionals, 2) to examine the major ethical issues confronting marketers, 3) to provide frameworks to help resolve the ethical dimensions of marketing decisions, and 4) to provide experience in making marketing decisions that involve ethical dilemmas through the use of case studies.

MKTG 640. Global Marketing Management. Lecture and discussion 3 hours; 3 credits. Prerequisite: MKTG 603 or permission of instructor. Examines the global environment of business and its potential effects on marketing principles and practices. The course will include the effect of culture on marketing mix strategies.

MKTG 650. Marketing on the Internet. Lecture 3 hours; 3 credits. Prerequisite: MKTG 603. Course examines the application of marketing theories to the internet. Topics include internet marketing strategy, electronic commerce,

web page development, and the impact of the internet in the international marketplace.

MKTG 660. Advertising and Integrated Marketing Communications. Lecture 3 hours; 3 credits. Prerequisite: MKTG 603 or permission of instructor. Introduces students to the concepts of integrated marketing communications (IMC). Students will learn how to formulate a firm's marketing communication strategy from an integrated perspective, become familiar with the various tools used in IMC programs, and develop necessary skills to develop an IMC plan for a business. Topics covered in the course include the role of the IMC in the marketing process, the IMC plan development process, the components of IMC media planning and budgeting for IMC, creative strategies, and assessment of the effectiveness of an IMC campaign.

MKTG 668. Marketing Internship. 1-3 credits. Prerequisites: MKTG 603, graduate standing, and permission of instructor. The course is a practicum in the field of marketing, applying theories, concepts, and marketing tools in a business environment.

MKTG 696. Selected Topics in Marketing. 3 hours; 3 credits. Prerequisites: permission of the graduate program director. Study designed for students who have had one or more of the required courses waived, or for students desiring additional work in a marketing area of particular interest.

MKTG 801. Seminar in Marketing Theory: History and Current Topics. Seminar 3 hours; 3 credits. Prerequisite: MKTG 603. This course focuses on theory development in marketing from the 1940s to the latest publications in marketing journals. The topics covered include philosophy of science, truth in research, the development of marketing theory and practice, and the current direction in marketing theory and research opportunities.

MKTG 802. Seminar in Marketing Concepts and Issues. Lecture 3 hours; 3 credits. This course examines the current academic research trends in the different functional areas of the marketing discipline. Topics covered include promotional theory, pricing theory, distribution theory, product theory, marketing strategy theory, marketing ethics, and multinational marketing.

MKTG 803. Seminar in Consumer Behavior. Lecture 3 hours; 3 credits. Prerequisite: MKTG 603. The purpose of this course is to provide a comprehensive and up-to-date understanding of the major research work carried out in consumer behavior. It examines major psychological constructs and phenomena related to consumer behavior and introduces students to various research approaches to consumer behavior issues.

MKTG 813. Fundamentals of Survey Research. Lecture 3 hours; 3 credits. Prerequisite: DSCI 711/811. This course focuses on the fundamental issues associated with survey research as found in the marketing/management disciplines. The topics covered are experimental and quasi-experimental designs, analysis of data from experimental designs, questionnaire design and refinement, and scale development. (cross-listed with DSCI 813)

MKTG 814. Seminar in Advanced Marketing Methodology. Lecture 3 hours; 3 credits. Prerequisites: DSCI 811, 812 and MKTG/DSCI 813. This course examines the design, analysis, and implementation of marketing research methods along with advanced statistical techniques. This is an integrative capstone course for the marketing research doctoral sequence of courses. The focus is on ensuring that the

marketing academic understands all aspects of data analysis and design issues.

MKTG 826. Seminar in International Marketing Problems. Seminar 3 hours; 3 credits. Prerequisite: MKTG 603. An analysis of planning, organization, and control functions of multinational marketing operations and how marketing procedures need to be developed/adapted for effective pursuit of business opportunities in other countries.

MKTG 827. Seminar in Marketing Planning and Strategy. Seminar 3 hours; 3 credits. Prerequisite: MKTG 603. Focus on contemporary marketing practice and provides opportunity to acquire a comprehensive understanding of the marketing planning process and the need for development of sound marketing strategy. Marketing goals, strategies, and tactics are examined in detail.

MKTG 895. Selected Topics in Marketing. 3 credits; 3 hours. Prerequisites: Ph.D. standing and permission of the chair and coordinator. Designed to provide the advanced student with an opportunity to study independently or in small groups and investigate specific topics of current interest in the field of marketing.

MKTG 899. Dissertation Research. 1-12 credits per semester with limitation of 24 credits. Prerequisite: advanced standing in Ph.D. program.

MKTG 999. Marketing 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Master of Business Administration — MBA

MBA 620. New Venture Creation. Lecture 3 hours; 3 credits. Prerequisites: ACCT 601, DSCI 600, ECON 604 and 612, FIN 605, MGMT 602, and MKTG 603. This course looks at the process of conceptualizing new ideas and developing a methodology for evaluating and commercializing new ventures. This includes the process of assessing ideas, understanding opportunities, gathering resources, the skills needed at each stage, and successfully implementing a commercial idea. The focus will be on the practical tools needed to be a successful entrepreneur.

MBA 621. Effective Business Writing. Lecture 1 hour; 1 credit. This course is designed to provide an understanding of communications in the management setting. Objectives include improvement of writing skills by understanding major grammar and mechanics errors, understanding the importance of audience, tone and style in professional writing and learning effective letter and memo formats used in professional writing.

MBA 622. Business Plan Development. Lecture 1 hour; 1 credit. Prerequisite: completion of core MBA courses. This course is designed to provide an integration of skills needed to develop an effective business plan. Lectures plus students will be assigned clients of the Entrepreneurial Center. Some students may bring their own projects.

MBA 623. Essential Business Communication Skills. Lecture 1 hour; 1 credit. This course will introduce students to concepts and discussion of major communication issues that occur in the workplace and will help students to develop skills to deal with communication issues. Course skills would include how to listen

effectively, understand nonverbal cues, manage conflict, and communicate non-defensively.

MBA 624. Employment Law and Regulation. Lecture 1 hour; 1 credit. This course will analyze the impact of employment-related statutes and case holdings on the business environment. Federal laws and guidelines relating to the employment relationship are numerous. This course, however, will focus on those that have the greatest impact on personnel decisions and which have increased risks faced by employers.

MBA 625. Leadership in Organizations. Lecture 1 hour; 1 credit. Students will develop a practical understanding of what the best research and documented practical experience have shown to be characteristic of effective leadership behavior in a range of organizational contexts. They will better evaluate their own and other's leadership in organizational settings.

MBA 626. Resolving Business Disputes: Alternatives to Litigation. Lecture 1 hour; 1 credit. An introduction to alternative dispute resolution (ADR), the name given to a variety of non-litigation processes, institutionalized to varying degrees, which lead to resolution of disputes.

MBA 627. Business Ethics. Lecture 1 hour; 1 credit. An examination and practical application of classical and modern ethical theories as criteria for decision making in a variety of current business situations.

MBA 628. Business in Global Cultures. Lecture 1 hour; 1 credit. One of the critical elements in conducting international business is sufficient preparation in learning the host country's culture. This course is designed to introduce students to concepts and methods of understanding and comparing cultures around the globe. The course draws heavily on the works of cross-cultural psychologists.

MBA 630. Issues in International Business. Lecture 1 hour; 1 credit. Prerequisites: MGMT 602 and MKTG 603. Designed to give students exposure to real life constraints on business development in the global arena. The course will examine development models, including wholly owned subsidiaries and joint ventures, and historical evolution of these models. It will explore the decision factors which are driving multinational companies to one model or another and will discuss likely future trends in global business development.

MBA 631. Negotiation. Lecture 1 hour; 1 credit. Prerequisite: MGMT 602. Designed to introduce the student to the concept of negotiation; to examine different types of negotiations, strategies and tactics; and to begin developing negotiating skills. Through lectures, class discussions, reading and practical exercises, the student will be introduced to the concepts and structures of different types of negotiations; achieve an understanding of some basic principles of conducting and participating in successful negotiations; and gain experience from participation in negotiation exercises.

MBA 632. Venture Capital: The Entrepreneur's Perspective. Lecture 1 hour; 1 credit. Prerequisite: ACCT 601, ECON 604, FIN 605, MGMT 602, and MKTG 603. The course will familiarize the students with the various aspects of venture capital. The perspective will be from both an entrepreneur's point of view and a venture capital firm. The goal is to expose students to a general overview of the salient issues in seeking, obtaining, and managing venture capital.

MBA 633. Creative Thinking in Business Decisions. Lecture 1 hour; 1 credit. Develops understanding and skills in applying a complete process of creative and critical thinking, problem solving and decision making in real world business situations. Uses a disciplined process of thinking, emphasizing both divergence and convergence. Emphasis on the concept of process awareness as distinct from content involvement. Individuals will be better equipped to help their organizations, teams, and selves be more effective, adaptable and flexible in the short and long run.

MBA 695. Selected Topics for MBA Modules. Lecture 1 hour; 1 credit. The study of selected topics not offered on a regular basis.

Operations Management — OPMT

OPMT 611. Operations Management with Quantitative Analysis. Lecture 3 hours; 3 credits. Prerequisite: DSCI 600. Introduces concepts and frameworks for making decisions concerning designing, planning and controlling service and manufacturing operations. Concepts and issues related to process, layout, materials management, capacity, and quality, and how they affect productivity and customer satisfaction are discussed. Quantitative techniques such as linear programming, PERT/CPM, and control charts are used to make appropriate decisions.

OPMT 624. Managing Services. Lecture 3 hours; 3 credits. Prerequisite: OPMT 611. Discusses the operations function in service organizations. Concepts and issues related to characteristics of services, managing demand, designing and delivering services, service processes and quality, human resource management in service systems will be discussed.

OPMT 667. Cooperative Education. 1-3 credits. Prerequisite: graduate standing. Approval for enrollment and allowable credits are determined by the department and Career Management in the semester prior to enrollment.

OPMT 668. Operations Management Internship. 1-3 credits. Prerequisite: graduate standing. Approval for enrollment and allowable credits are determined by the department and Career Management in the semester prior to enrollment.

OPMT 695. Selected Topics in Operations Management. 3 credits. Prerequisite: permission of the department chair and the graduate program director.

OPMT 697. Independent Study in Operations Management. 3 credits. Prerequisite: OPMT 611. Affords students the opportunity to undertake independent study under the direction of a faculty member.

OPMT 795/895. Topics. Lecture 3 hours; 3 credits.

Public Administration — PADM

PADM 632. Environmental Planning. Lecture 3 hours; 3 credits. Environmental analysis and the planning process; administrative agency structure, policy development, regulation and enforcement, content and use of the environmental impact statement.

PADM 633. Methods of Urban Planning. Lecture 3 hours; 3 credits. A survey of the methods of local planning in the governmental and administrative setting. The course is geared toward the administrator and technician in dealing with urban planning problems.

PADM 634. Regional Planning. Lecture 3 hours; 3 credits. The course analyzes the origins of

regional planning agencies, current organizational structures, financing and functional activities. The focus is on the application of the systems approach to metropolitan planning issues. This latter objective is achieved through participation in exercises dealing with economics, transportation and land-use allocation modeling.

PADM 640. Urban and Regional Issues. Lecture 3 hours; 3 credits. Prerequisite: permission from an advisor. Basic definitions and concepts in urban studies, interdisciplinary perspectives on the urban process from the perspectives of history, economics, geography, sociology, political science and related disciplines. Some focus on the qualities of urban research activities.

PADM 651. Administrative Theory I: The Context of Public Administration. Lecture 3 hours; 3 credits. Introduction to the profession of public administration; the evolution and development of the field, the role of organizations in contemporary American government, and the roles of politics and administration. The course also provides an introduction to the necessary skills for successful graduate study.

PADM 652. Administrative Theory II: The Process of Public Administration. Lecture 3 hours; 3 credits. Prerequisite: PADM 651. Introduction to management in the public sector. Topics include: organizing public agencies, managing people and work groups, introduction to organizational systems (human resources, budget, and information systems), and effective leadership and decision-making processes.

PADM 655. Theories of Public Organization. Lecture and discussion 3 hours; 3 credits. Analysis of public organizations from environmental (macro) and organizational (micro) viewpoints, viewed as both closed and open systems. The course also examines organizational behavior, design, structure and evaluation.

PADM 668. Internship/Field Experience. 3 or 6 credits. Required of all students without previous experience in government service. Supervised work experience in a public agency. A written report will be required.

PADM 671. Public Budgeting and Financial Management. Lecture 3 hours; 3 credits. The purpose of this course is to examine the institutions, principles, and techniques of national, state, and local budgeting processes and financial administration. The course explores the allocation as well as the re-distributive role of government and the market. While applying information technology, students will analyze the practices and fundamental concepts of government budgeting, financial management, and public finance, with an emphasis on revenue, expenditure, capital budgeting and debt structures.

PADM 672. Public Financial Management. Lecture 3 hours; 3 credits. Prerequisite: PADM 671. Examination of public sector financial management principles, practices and processes. Emphasis on financial auxiliary services employed in local government financial management. Introduction to governmental accounting practices and financial statements. Micro computer applications to public sector financial decision-making techniques.

PADM 695. Advanced Topics. Lecture and discussion; 1-3 credits. Topics vary each semester.

PADM 696. Directed Readings. 1-3 credits. Specifically planned readings for the graduate student who wishes to pursue special interests outside the scope of formal studies. Supervised on an individual basis.

PADM 698. Directed Research. 1-6 credits. Supervised research on a specific program. A written report will be required.

PADM 699. Thesis. 6 credits. An approved research project, written under the supervision of a faculty committee, in which the student demonstrates the capacity to design and complete independent scholarly investigation. The completed project must be approved by the thesis committee.

PADM 701. Public Policy and Evaluation. Lecture and discussion 3 hours; 3 credits. Exploration of key theories and approaches to public policy. This course covers all phases of the policy process, from formulation to evaluation, with particular focus upon the substance, political dynamics, and evolution of public policy.

PADM 702. Urban Resource Allocation. Lecture 3 hours; 3 credits. This course has three basic emphases: (a) theories of resource allocation; (b) analytical techniques useful in resource allocation analysis; and (c) methods of control for resource allocation. Includes techniques of cost effectiveness, budgeting, expenditure analysis as they relate to the urban environment.

PADM 704. Methods of Public Program Evaluation. Lecture 3 hours; 3 credits. Prerequisite: PADM 753/853. Examination of various methodologies for designing and conducting program evaluation and research. Experimental, quasi-experimental and nonexperimental procedures will be covered.

PADM 705. Urban Law and Public Policy. Lecture 3 hours; 3 credits. Focuses on legal aspects of urban policy by analyzing primary legal materials, including court decisions and legislative and administrative regulations. Skills of legal interpretation and legal draftsmanship are developed.

PADM 708. Urban and Regional Economic Development. Lecture 3 hours; 3 credits. This course examines the theory and practice of urban and regional economic development. The tools, institutions, and analytical techniques of urban and regional economic development are examined in light of relevant public policy issues.

PADM 711. Urban Services Administration. Lecture and discussion 3 hours; 3 credits. Analysis of the range of administrative tools and strategies for the delivery of urban services. Emphasizes new administrative alternatives under conditions of urban change.

PADM 712. Emergency Management and Policy. Lecture 3 hours; 3 credits. Explores policy and regulatory issues of emergency management; intergovernmental responsibilities and relationships among local, state and federal agencies in an "all hazards" approach to preparing and responding to manmade and natural disasters. Examines challenges faced by local, state, and federal managers during a large scale disaster.

PADM 714. Public-Private Partnerships. Lecture 3 hours; 3 credits. An in-depth analysis of the forces behind the privatization movement. Examines the context of privatization, the theoretical and empirical arguments on both sides of the debate, and the different forms of privatization practiced in the U.S. The course draws on a wide range of disciplines in a quest for an understanding of the privatization phenomenon—political science, public administration, public policy, sociology, economics, management, and others.

PADM 715. Management of Nonprofit Organizations. Lecture 3 hours; 3 credits. Explores the history and role of the nonprofit

sector; the management of nonprofit entities including strategic planning, marketing, financial management and evaluation in nonprofit organizations. The course examines the differences and similarities between public, private and nonprofit sectors; and reviews issues facing nonprofit organizations within the context of current social, political and economic environments.

PADM 718. Contract Management. Lecture 3 hours; 3 credits. Examines public sector contracting including preliminary design of contracts, contract budgeting, developing specifications, scope of services, bid solicitation, RFPs, evaluation of bids, and awarding and administering contracts. Reviews state and federal laws pertaining to governmental contracting, and examines minority procurement programs, local preference issues, and the impact of fraud, waste and abuse in public sector contracting.

PADM 719. Leadership. Lecture 3 hours; 3 credits. Examines leadership through theoretical and practice-based frameworks. Offers analytical and intellectual examination and reflection on core issues in the practice of leadership. These objectives will be achieved through open discussion, honest self-assessment, experiential exercises, and observation of real-life leadership practice.

PADM 720. Public Personnel Administration. Lecture 3 hours; 3 credits. Examines the basic framework of the public personnel system beginning with the legal requirements imposed by federal and state laws and regulations. General considerations of policy and procedures development, the organization of the public personnel system, the adoption of the personnel ordinance, the determination of various levels of employee status and the coverage of the personnel system are included.

PADM 723. Ethics in Public Administration. Lecture 3 hours; 3 credits. Prerequisite: PADM 651. This course reviews the theory and application of ethics in the public sector, identifying public values and how they apply in the administration of government. It reviews sources of values employed in public sector decision-making, and reviews how values in public administration are managed and applied. Systems of professional ethics are reviewed in the context of public professions. Case studies and best practices are examined to help the student understand the application of administrative ethics in public management.

PADM 724. Administration of Human Services. Lecture 3 hours; 3 credits. Analysis of human services involving direct client/agency interaction. Problems of discretion and control are examined as alternative service delivery strategies which can deal with these problems.

PADM 725. Business, Government, and Society. Lecture 3 hours; 3 credits. Prerequisite: six completed hours of graduate work in MBA or MPA program. An overview of business-government-society interactions, with special attention to the influence of public policy and corporate strategy on corporate social responsibility. An important theme is the ethical component of management decision making.

PADM 730. Theories of Conflict Resolution and Problem Solving. Lecture 3 hours; 3 credits. An introduction to the field of alternative dispute resolution methods and problem solving. The first part of the course focuses on conflict theory at all levels of human social systems and the second part examines collaborative problem solving strategies.

PADM 733. Legal and Ethical Foundations of Public Administration. Lecture 3 hours; 3 credits. Introduces the role of law in ordering public administration through the application of constitutional values and administrative law principles in administrative practice. Introduces ethical theories and applications in the public sector, examining values within administrative environments. Topics include privacy in information systems management, whistleblowing, and other cases of applied ethical reasoning in the practice of public administration.

PADM 734. Negotiation and Dispute Resolution. Lecture 3 hours; 3 credits. Prerequisite: PADM 730. The course provides conceptual and practical skills in negotiations. It examines the underlying cultural, legal, and organizational issues and problems that affect managing human resources in the workplace.

PADM 737. Digital Government. Lecture 3 hours; 3 credits. This course provides public administrators knowledge of current technology issues in the public sector and familiarizes them with technological tools used in delivering public services. The course explores administrative responsibility and accountability in digital government, and problems in managing technology in the public sector. Issues concerning citizen privacy, freedom of information requirements, planning, coordinating and sharing information among public sector agencies and the private sector, and building community networks are reviewed.

PADM 738. Conflict Mediation and Arbitration. Lecture 3 hours; 3 credits. Prerequisite: PADM 730. Surveys the field of third-party intervention in dispute resolution. Provides practical skills in mediation and arbitration. Examines the nature and effectiveness of mediation in a wide variety of disputes including labor relations, community, family, environmental, and international conflicts.

PADM 745. Managing Development and Change in Organizations. Lecture/cases/activities; 3 credits. Examination of the theory and practice of organization development. Participants will take the role of change agent and public manager and apply a range of organization development techniques to public agency situations while giving attention to the particular cultural, political, legal and organizational characteristics of public organizations.

PADM 746. Capstone Seminar in Public Administration. Lecture 3 hours; 3 credits. Prerequisite: completion of 30 hours in the MPA program or permission of instructor. Presents an integrated approach to the field of public administration, and examines the political, administrative, and social implications of administrative choices. The emphasis of the course will be a case approach to public administration and public management.

PADM 753. Research Methods in Public Administration. Lecture 3 hours; 3 credits. Prerequisite: PADM 410 or equivalent course work. This course examines various methods for designing and conducting research, collecting and organizing data, and disseminating results. Information technology and applications to practical management problems and public research topics are emphasized.

PADM 781. Intergovernmental Management. Lecture 3 hours; 3 credits. Analysis of relationships among federal, state, and local governmental units in the delivery of

governmental programs. Focus on intergovernmental issues in urban metropolitan regions.

PADM 795. Advanced Topics in Public Personnel Administration. Lecture 3 hours; 3 credits. An examination of selected topics including job analysis, position classification, test construction, performance appraisal, and affirmative action. The course emphasizes the everyday application of these topics through in-class exercises and short papers. Permission of advisor is required.

Public Administration and Urban Policy — PAUP

PAUP 801. Public Policy and Evaluation. Lecture 3 hours; 3 credits. Exploration of key theories and approaches to public policy. This course covers all phases of the policy process, from formulation to evaluation, with particular focus upon the substance, political dynamics, and evolution of public policy.

PAUP 802. Logic of Social Inquiry. Lecture 3 hours; 3 credits. Social inquiry, the production and application of social science knowledge in the field of public administration/ public management and urban policy, is replete with contending philosophical and paradigmatic points of view. The goal of this course is to provide a forum for students to review and critique the major issues within social inquiry: ways of knowing (questions of epistemology and methodology), ways of deciding and ways of acting upon decisions.

PAUP 804. Methods of Urban Program Evaluation. Lecture 3 hours; 3 credits. Prerequisite: PADM 753 or URBN 607. Examination of various methodologies for designing and conducting public urban program evaluation and research. Experimental, quasi-experimental and nonexperimental procedures will be covered.

PAUP 805. Urban Law and Public Policy. Lecture 3 hours; 3 credits. Focuses on legal aspects of urban policy by analyzing primary legal materials, including court decisions and legislative and administrative regulations. Skills of legal interpretation and legal draftsmanship are developed.

PAUP 806. Urban Resource Allocation. Lecture 3 hours; 3 credits. This course has three basic emphases: (a) theories of resource allocation; (b) analytical techniques useful in resource allocation analysis; and (c) methods of control for resource allocation. Includes techniques of cost effectiveness, budgeting, expenditure analysis as they relate to the urban environment.

PAUP 807. Urban Theory and Practice. Lecture 3 hours; 3 credits. Prerequisite: permission of instructor or graduate program director. The purpose of this course is to convey an understanding of urban theory and practice in the culturally diverse urban environment. The course focuses on the process of urbanization, social differentiation, and social and political organization. Special emphasis is given to the role of technology in contributing to urban change.

PAUP 808. Administrative Theory and Behavior. Lecture 3 hours; 3 credits. The course reviews the broad topics of administration theory, behavior and practice in organizations and focuses on the development of management thoughts, as well as the macro and micro organizational processes in public and non-profit organizations.

PAUP 810. Public Law and Urban Governance. Lecture 3 hours; 3 credits. Public law defines the structure and authorized practices

of public institutions in urban settings. The course reviews the legal powers of state and local government in the U.S., of cities, counties, public authorities and special districts, and of nontraditional forms of governance including principal-agent relations in the production of public services, regulatory governance, delegation of public authority to private entities, and citizen roles in governance.

PAUP 811. Urban Services Administration. Lecture and discussion 3 hours; 3 credits. Analysis of the range of administrative tools and strategies for the delivery of urban services. Emphasizes new administrative alternatives under conditions of urban change.

PAUP 814. Public-Private Partnerships. Lecture 3 hours; 3 credits. An in-depth analysis of the forces behind the privatization movement. Examines the context of privatization, the theoretical and empirical arguments on both sides of the debate, and the different forms of privatization practiced in the U.S. The course draws on a wide range of disciplines in a quest for an understanding of the privatization phenomenon—political science, public administration, public policy, sociology, economics, management, and others.

PAUP 820. Public Personnel Administration. Lecture 3 hours; 3 credits. Examines the basic framework of the public personnel system beginning with the legal requirements imposed by federal and state laws and regulations. General considerations of policy and procedures development, the organization of the public personnel system, the adoption of the personnel ordinance, the determination of various levels of employee status and the coverage of the personnel system are included.

PAUP 823. Ethics in Public Administration. Lecture 3 hours; 3 credits. Prerequisite: PADM 651. This course reviews the theory and application of ethics in the public sector, identifying public values and how they apply in the administration of government. It reviews sources of values employed in public sector decision-making, and reviews how values in public administration are managed and applied. Systems of professional ethics are reviewed in the context of public professions. Case studies and best practices are examined to help the student understand the application of administrative ethics in public management.

PAUP 824. Administration of Human Services. Lecture 3 hours; 3 credits. Analysis of human services involving direct client/agency interaction. Problems of discretion and control are examined as alternative service delivery strategies which can deal with these problems.

PAUP 825. Business, Government, and Society. Lecture 3 hours; 3 credits. Prerequisite: six completed hours of graduate work in MBA or MPA program. An overview of business-government-society interactions, with special attention to the influence of public policy and corporate strategy on corporate social responsibility. An important theme is the ethical component of management decision making.

PAUP 830. Theories of Conflict Resolution and Problem Solving. Lecture 3 hours; 3 credits. An introduction to the field of alternative dispute resolution methods and problem solving. The first part of the course focuses on conflict theory at all levels of human social systems and the second part examines collaborative problem solving strategies.

PAUP 833. Legal Foundations of Public Administration. Lecture 3 hours; 3 credits. Focus

on the processes of law and law application by the executive departments of government and especially the independent regulatory agencies, and their control by legislature and court. Examination of the political origins and constitutional status of administrative agencies and of administration discretion.

PAUP 834. Negotiation and Dispute Resolution. Lecture 3 hours; 3 credits. Prerequisite: PADM 730. The course provides conceptual and practical skills in negotiations. It examines the underlying cultural, legal, and organizational issues and problems that affect managing human resources in the workplace.

PAUP 837. Digital Government. Lecture 3 hours; 3 credits. This course provides public administrators knowledge of current technology issues in the public sector and familiarizes them with technological tools used in delivering public services. The course explores administrative responsibility and accountability in digital government, and problems in managing technology in the public sector. Issues concerning citizen privacy, freedom of information requirements, planning, coordinating and sharing information among public sector agencies and the private sector, and building community networks are reviewed.

PAUP 838. Conflict Mediation and Arbitration. Lecture 3 hours; 3 credits. Prerequisite: PADM 730. Surveys the field of third-party intervention in dispute resolution. Provides practical skills in mediation and arbitration. Examines the nature and effectiveness of mediation in a wide variety of disputes including labor relations, community, family, environmental, and international conflicts.

PAUP 845. Managing Development and Change in Public Organizations. Lecture/cases/activities; 3 credits. Examination of the theory and practice of organization development. Participants will take the role of change agent and public manager and apply a range of organization development techniques to public agency situations while giving attention to the particular cultural, political, legal and organizational characteristics of public organizations.

PAUP 853. Research and Evaluation Design. Lecture 3 hours; 3 credits. The course examines advanced research design and evaluation methods used in public administration and management research. Experimental, quasi-experimental, and non-experimental procedures in the context of urban settings will be emphasized. Includes usage of various statistical software.

PAUP 868. Urban Services Internship. 3 credit hours. Urban field experience for students in the Ph.D. in Public Administration and Urban Policy program. Supervised work experience in a public agency. A written report is required.

PAUP 881. Intergovernmental Management. Lecture 3 hours; 3 credits. Analysis of relationship among federal, state, and local governmental units in the delivery of governmental programs. Focus on intergovernmental issues in urban metropolitan regions.

PAUP 890. Dissertation Seminar. 3 credit hours. A multidisciplinary seminar that focuses on the design, implementation, and evaluation of urban programs under real-life conditions in the field. Students and faculty work with urban decision makers utilizing problem-solving skills and analysis.

PAUP 898. Directed Research. 1-6 credits. Supervised research on a specific problem. A written report is required.

PAUP 899. Dissertation. 1 to 12 credits. An approved research project, written under the supervision of a faculty advisor, in which the student demonstrates the capacity of design and completes independent applied research. The completed project must be approved by the dissertation committee.

PAUP 999. Public Administration and Urban Policy 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Taxation — TAX

TAX 650. Tax Strategies for Business Decisions. Lecture 3 hours; 3 credits. Prerequisite: 201-202, 301, 311 and 421 or equivalent courses, each with a B- or better. An intensive course in taxation. Focuses on the choice of business entity by covering taxation of corporations (both C and S corporations), partnerships and sole proprietorships. The course emphasizes research skills and professional ethics.

TAX 651. Taxation of Corporations I. Lecture 3 hours; 3 credits. Prerequisite: ACCT 421/521 or equivalent. Covers federal income taxation of corporations and shareholders. Includes organizing a corporation; establishing capital structure; determining tax liability; dividends and other non-liquidating distributions; stock redemptions; and liquidations.

TAX 652. Taxation of Partners and Partnerships. Lecture 3 hours; 3 credits. Prerequisite: ACCT 421/521 or equivalent. Taxation of partners and partnerships: formation, termination, distributions and liquidations, and sales of partnership interests. Limited partnerships in conjunction with their use as tax shelters, and the multifaceted attributes of family partnerships.

TAX 653. Taxation of Estates and Gifts. Lecture 3 hours; 3 credits. Prerequisite: ACCT 421/521 or equivalent. Examines transfers under federal estate and gift tax laws. Includes property owned by the decedent; retained life estates; transfers taking effect at death; transfers with retained powers; concurrent property interest; powers of appointment; valuation problems; expenses, debts, and taxes; charitable bequests; marital deduction; taxable inter vivos gifts; gift splitting and credits; consideration of Chapter 14 and asset freezing techniques; and transfer taxation of life insurance.

TAX 654. Income Taxation of Estates, Trusts & Beneficiaries. Lecture 3 hours; 3 credits. Prerequisite: TAX 653. Examines simple, complex, and revocable trusts; trusts accumulation distributions; income in respect of decedents; trust accounting income; distributable net income; terminations; excess deductions; basis rules; and the decedent's final income tax return.

TAX 655. Taxation of Corporations II. Lecture 3 hours; 3 credits. Prerequisite: TAX 651. Analyzes the different types of taxable and tax-free acquisitions and reorganizations. Includes determining tax consequences for corporations and shareholders involved in an acquisition or reorganization and analyzing necessary requirements for a tax-free corporate division (spin-off). Covers aspects of filing consolidated federal income tax returns.

TAX 656. Taxation of Deferred Compensation. Lecture 3 hours; 3 credits. Prerequisite: TAX 651. Discusses federal income taxation of deferred compensation plans with emphasis on qualified retirement plans. Reviews plan qualification requirements, reporting and disclosure requirements, and distribution rules. Includes discussion of specific types of plans such as Sec. 401(K) and ESOPs.

TAX 657. State and Local Taxation. Lecture 3 hours; 3 credits. Prerequisite: ACCT 421/521 or equivalent. Examines state levying of individual income, corporate income, property, sales, and excise taxes.

TAX 658. Tax Aspects of International Business. Lecture 3 hours; 3 credits. Prerequisite: ACCT 421/521 or equivalent. Taxation of foreign persons conducting business in the U.S. including FIRPTA, source of income rules, and residency requirements; taxation of U.S. individuals and businesses doing business abroad including FSCs, CFCs, FHP Co's and possessions corporations.

TAX 660. Taxation of Property Transactions. Lecture 3 hours; 3 credits. Prerequisite: ACCT 421/521 or equivalent. Covers determination of realized and recognized gains and losses and their tax treatment on property dispositions. Includes consequences of property transactions, such as depreciation, depletion, basis and capital gains problems.

TAX 661. Taxation of the Small Business Corporation. Lecture 3 hours; 3 credits. Prerequisite: ACCT 421/521 or equivalent. Covers federal income taxation of S corporations including election eligibility; termination of status; treatment of income and deduction items; distributions; and basis of stock and debt. Also discusses compensation arrangements in closely held corporations; fiscal year issues; personal service corporations; the advantages of C corporations versus S corporations; corporation liquidation and redemption rules; and the S corporations's built-in gains tax.

TAX 662. Tax Procedure and Practice. Lecture 3 hours; 3 credits. Prerequisite: ACCT 421/521 or equivalent. Discusses procedures for dealing with the IRS. Includes sources of IRS policy; processing returns; auditing returns; rulings and determination letters; assessments and collections; and interest and civil penalties.

TAX 695. Selected Topics in Taxation. Lecture 3 hours; 3 credits. Prerequisite: ACCT 421/521 or equivalent. Examines the unique rules applicable to federal taxation of farmers and ranchers. Also, covers the basics on the new Limited Liability Company and Virginia law on LLCs. Topics may vary each year.

TAX 697. Independent Study. 3 credits. Prerequisites: ACCT 421/521 or equivalent and approval of instructor. Individually supervised research projects in selected tax areas. Approval of supervising professor as to topic and evaluation of project required at time of registration.

Darden College of Education

www.education.odu.edu/

William H. Graves, Dean

David Branch, Associate Dean, Undergraduate Education and College Services

Sharon Judge, Associate Dean, Graduate Education and Assessment

The Darden College of Education offers the Master of Science (M.S.), Master of Science in Education (M.S.Ed.), and Educational Specialist (Ed.S.) degrees as well as the Doctor of Philosophy (Ph.D.) degree in the following broad concentrations and areas:

Counseling

Ph.D. in Counseling

Ed.S. Counseling

M.S.Ed. Counseling

Community College Leadership

Ph.D. in Community College Leadership

Curriculum and Instruction

Ph.D. in Curriculum and Instruction

Early Childhood Education

Ph.D. in Early Childhood Education

M.S.Ed. Early Childhood Education with PK-3 licensure

M.S.Ed. Early Childhood Education – research emphasis for currently licensed teachers

Educational Leadership

Ph.D. in Educational Leadership

Ed.S. Educational Leadership

Ed.S. Educational Leadership with PreK-12 licensure

M.S.Ed. Educational Leadership with PreK-12 Licensure

Educational Leadership licensure only (non-degree)

Field-Based Masters Programs

Higher Education

Ph.D. in Higher Education

Ed.S. Higher Education

M.S.Ed. Higher Education

Instructional Design and Technology Programs

Ph.D. in Instructional Design and Technology

M.S.Ed. Elementary/Middle School Instructional Design and Technology

M.S.Ed. Secondary Instructional Design and Technology

Library Science – School Librarianship

M.S.Ed. K-12 Endorsement for licensed teachers

M.S.Ed. Initial Licensure for non-teachers

Library Science Endorsement for licensed teachers (non-degree)

Military Career Transition Program

M.S.Ed. Initial Licensure Program (Prek-6)

M.S.Ed. Initial Licensure Program - Middle School (Grades 6-8)

M.S.Ed. Initial State Licensure 6-12

Occupational and Technical Studies

Ph.D. in Occupational and Technical Studies

M.S. Business and Industry Training

M.S. Community College Teaching

M.S. Middle/Secondary Education

Physical Education

M.S.Ed. Athletic Training

M.S.Ed. Athletic Training with Initial Virginia Licensure in Physical Education and Health Education (PreK-12)

M.S.Ed. Exercise Science and Wellness
 M.S.Ed. Physical Education and Health Education Curriculum and Instruction (PreK-12)
 M.S.Ed. Physical Education and Health Education Curriculum and Instruction with
 Initial Virginia Licensure (PreK-12)
 Ph.D. in Human Movement Science
 M.S.Ed. Recreation and Tourism Studies
 M.S.Ed. Sport Management
 PreK-6 (Elementary) and Middle School Programs
 M.S.Ed. Fifth Year Initial Licensure Elementary (PreK-6)
 (Continuation of undergraduate Interdisciplinary Studies program)
 M.S.Ed. Initial Licensure - PreK-6
 M.S.Ed. Initial Licensure – Middle School (6-8)
 M.S.Ed. Licensed Teachers - Elementary/Middle School– General
 M.S.Ed. Elementary/Middle School – Science
 Reading Education
 Ph.D. Literacy Leadership
 M.S.Ed. Reading plus Reading Specialist Endorsement
 Endorsement – Reading Specialist K-12 (non-degree)
 Secondary Education Programs
 M.S.Ed. Initial State Licensure 6-12
 M.S.Ed. Licensed Teacher –6-12
 Special Education
 Ph.D. in Special Education
 M.S.Ed. Special Education–research emphasis for currently
 licensed teachers
 M.S.Ed. Special Education with initial K-12 licensure
 Speech-Language Pathology
 M.S.Ed. Speech-Language Pathology

Darden College of Education

218 Education Building
757-683-3938 (office)
757-683-5083 (fax)

The Darden College of Education is comprised of the following departments: Communication Disorders and Special Education; Counseling and Human Services; Educational Foundations and Leadership; Human Movement Sciences; Science, Technology, and Mathematics Education and Professional Studies; and Teaching and Learning. The Office of Teacher Education Services and Advising in the Darden College of Education supports teacher education programs in the College of Arts and Letters, the College of Sciences, and the Darden College of Education. The college also houses Programs for Research and Evaluation in Public Schools (PREPS), a research center charged with assisting school divisions within the Commonwealth of Virginia to meet the requirements of PL 107-110, the No Child Left Behind Act of 2001. The college is the headquarters for Virginia Troops to Teachers and houses Career Switchers, an accelerated alternate pathway to teacher licensure.

Mission. The Darden College of Education is committed to excellence in teaching, scholarly activities, and service. The college strives to meet the needs of the community while maintaining national and international prominence and is dedicated to preparing distinguished professionals who are leaders in their field. The college fulfills its mission through its undergraduate and graduate programs in the fields of education, counseling and human services, exercise science, athletic training, sport management, recreation, training, fashion, speech-language disorders, and instructional and industrial technology as well as its continuing education activities.

Purpose. Old Dominion University's major purpose in its teacher education programs is to prepare teachers and educational leaders who have knowledge of their teaching disciplines, abilities to practice state-of-the-art instruction to students of various cultural and socioeconomic backgrounds, and demonstrate dispositions which reflect commitment to teaching and learning as well as lifelong professional growth and development. In addition to teacher education, the Darden College of Education also prepares individuals to work in agencies and other settings.

Goals. The teacher preparation programs embrace several broad goals. Candidates will possess the following:

- a) Knowledge of their teaching field(s);
- b) Pedagogical knowledge of principles and strategies which pertain to classroom organization and instructional practices;
- c) Knowledge of curricular content, classroom organization, instructional materials, and industrial technology;
- d) Knowledge of learners' developmental characteristics and diversity;
- e) Knowledge of educational contexts, ranging from group dynamics in classrooms, to the governance and financing of school divisions, to the characteristics and expectations of communities which schools serve;
- f) Knowledge of educational values, purposes, ends, history, and philosophies which pertain to schooling in a democracy;
- g) Ability to conduct research and utilize research findings in decisions to improve long-range planning, school operation and student learning.
- h) All education programs are accredited by the National Council for the Accreditation of Teacher Education (NCATE). Teacher licensure programs are also approved by the Department of Education of the Commonwealth of Virginia.

The graduate programs provide Virginia and other regions with eleven broad majors for the Master of Science in Education, three majors in the Master of Science and two majors for the Education Specialist. The Doctor of Philosophy degree is offered in 11 areas. Within these graduate majors are over 50 related interest areas designed to address the professional needs of students and the communities they serve. The prime objective of graduate programs is to improve the professional skills and attitudes of students to enable them to influence the quality of education (teaching, leadership, counseling, research, training, and community services) at the state, regional, national and international levels.

Portfolio Assessment Policy. All students seeking admissions into any Teacher Education Program upon enrolling/registering for their first Education class are required to purchase the Web-based Portfolio Assessment System approved by the Teacher Education Council. In addition, any student taking a course in which the instructor requires the Web-based Portfolio Assessment

System will be required to purchase this system. Information can be found on the DCOE website: <http://education.odu.edu>

Fast Track Admissions Policy. Fast Track graduate admission will be available to undergraduate students in the Old Dominion University Interdisciplinary Studies, Teacher Preparation Concentration as well as undergraduate students who have completed teacher preparation emphasis degrees in art, dance, English, foreign languages, geography, history, marketing education, math, music, physical education, political sciences, sciences, technology education, and theatre. To be considered under the Fast Track graduate admissions policy, students must earn the B.S. or B.A. degree from Old Dominion University and must be applying to an M.S.Ed. degree in PreK-3/early childhood education, PreK-6 elementary education, middle school education, secondary education, or special education.

In addition, to be considered for Fast Track graduate admission, an applicant must (1) have a minimum 3.20 undergraduate cumulative GPA at Old Dominion University; and (2) have passing scores in EACH of the three sections of the PRAXIS I examination (or equivalent SAT/ACT test scores) as established by the Commonwealth of Virginia. Composite scores will not be considered.

Department of Communication Disorders and Special Education

Nicholas G. Bountress, Chair
Child Study Center
757 683-4117

The Department of Communication Disorders and Special Education is housed in the Lions Child Study Center (4501 Hampton Blvd.), a building that was made possible through the generosity of civic clubs, alumni, patrons and students and which opened in 1997. The clinical programs, housed in the center, give students valuable practical experience, deliver needed professional and educational services to members of the Hampton Roads community, and provide a laboratory setting for innovative faculty and student research. The department's strategic objective is to prepare future clinicians, educators, leaders, researchers, and policy makers to be a resource for state and national initiatives, and to serve as an exemplary center for educational research and practice. The faculty is dedicated to preparing professionals to serve as recognized leaders in the fields of education, clinical settings and agencies. PhD program is offered in special education, and master's degree programs are offered in special education, and speech-language pathology. Licensure-only program is offered in special education.

Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in the catalog. Students should obtain current program information from their advisors and the Darden College of Education website at <http://education.odu.edu/>.

Individual programs are described on the following pages in this order:

Special Education

- Master of Science in Education-Research Emphasis
- Master of Science in Education with General Curriculum K-12 licensure
- Master of Science in Education with Adapted Curriculum K-12 Licensure
- Master of Science in Education with Early Childhood Special Education Licensure
- Licensure Only- General Curriculum K-12 licensure
- Licensure Only- Adapted Curriculum K-12 licensure
- Licensure only - Early Childhood Special Education
- Doctor of Philosophy in Education with a concentration in Special Education

Speech-Language Pathology

- o Master of Science in Education

Master of Science in Education—Special Education

Child Study Center
757-683-4383

Cheryl S. Baker, Graduate Program Director

Within the Master of Science in Education—special education degree program, there are two programs: one for licensed teachers who seek an advanced degree with a research emphasis and the other for those who seek initial licensure in special education and a master's degree. The special education graduate program is committed to a philosophy of serving as a catalyst to promote awareness, understanding, and acceptance of individuals with disabilities. The course work focuses on the improvement of the quality and scope of educational and related services available to individuals with disabilities from infancy to adulthood.

Special Education, Research Emphasis

A master's degree in special education with research emphasis will provide educators with an advanced professional degree and qualifications beyond licensure. The emphasis will include a focus on scholarly research, statistical analysis, and writing for professional journals. This emphasis will also serve as the prerequisite course work to the Ph.D. in special education, thereby facilitating entry into the Ph.D. program for master educators seeking terminal degrees. This program is well grounded in current federal education law, which mandates familiarity with and use of evidence-based practices for educators.

Admission. Admission to the graduate program in special education is granted by the department's graduate program director in conjunction with special education faculty. The following requirements are necessary for admission to the program. Students must:

1. hold a baccalaureate degree from an accredited institution;
2. hold a Virginia Collegiate Professional License or an equivalent license from another state for special education;
3. have an undergraduate grade point average of 2.80 or better;
4. take and receive satisfactory scores on either the Graduate Record Examination (score of 900 combined on verbal and quantitative with a minimum of 450 verbal for regular admission and 4.5 on the analytical writing section) or Miller Analogies Test (score of 400 for regular admission); and,
5. submit a 400-500 word goal statement indicating why the student wishes to enroll in the special education program. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director.

Continuance. Students must:

1. maintain a grade point average of 3.00 overall, and
2. successfully complete all competencies relative to their program of study.

Exit. Students must:

1. have a grade point average of 3.00 overall and a grade of B- or better in all course work;
2. satisfactorily complete all program requirements including the written comprehensive exam;
3. complete a Graduate Student Assessment;
4. complete the Post Task Rating Form online at <http://education.odu.edu/esse/>; and,
5. submit a written research project according to program guidelines prior to the awarding of the master's degree in special education.

Program Requirements

For all students who have met the prerequisite requirement of licensure in special education, the master's degree requires a minimum of 30 credits of graduate study.

Curriculum

Introductory Courses – 6 credits

ESSE 701/801	Historical and Contemporary Research in Special Education	3
ESSE 702/802	Cognitive Processes and Learning Strategies	3

Research Core Courses - 12 credits

ECI 635	Research Methods in Education	3
ELS 732	Statistics Applied to Research in Education and Human Services I	3
ESSE 636	Problems in Education	3
ESSE 720	Curriculum/Instruction: Research into Practice	3
Electives - choose at least five - 15 credits		
ESSE 618*	Characteristics and Advanced Procedures: Emotional/Behavioral Disorders	3
ESSE 621*	Effective Interventions for Children and Youth with Challenging Behavior	3
ESSE 623*	Characteristics and Advanced Procedures: Mental Retardation	3
ESSE 625	Teaching Students with Autism Spectrum Disorders	3
ESSE 626*	Characteristics and Advanced Procedures: Learning Disabilities	3
ESSE 628*	Teaching Students with Severe Disabilities	3
ESSE 630*	Teaching Preschoolers with Disabilities	3
ESSE 714/814*	Alternative Strategies for Secondary Level Students	3
ESSE 715/815*	Alternative Strategies for Elementary Students: Prevention and Intervention	3

*Requires a 45-hour practicum and passing scores on Praxis 1 or equivalent exemption. (See Practicum Experiences Policy)

Special Education, K – 12 Licensure

The special education master's program prepares teachers and agency personnel to design and implement programs for individuals with disabilities in a variety of settings. This master's degree program, with endorsement, can be completed in approximately two years during which the enrolled students will specify either special education/general curriculum, K – 12, early childhood special education, or special education/adapted curriculum, K - 12. Due to changing University requirements, national accreditation standards, and state licensure regulations, the programs in teacher education are under constant revision. Students are encouraged to obtain current program information from the Special Education Program website at: <http://education.odu.edu/esse/>.

The graduate licensure programs in special education, in addition to meeting the Master of Science in Education degree requirements, satisfy Virginia Department of Education teacher endorsement competencies. Graduates are prepared to work effectively with children, adolescents, and adults who require special educational services. Classroom instruction is supplemented by field experiences with children, adolescents, and adults in a variety of settings. Teacher interns have been placed in children's hospitals, special education classes in public and private facilities, regional education programs, residential psychiatric hospitals, mental health centers, and community agencies.

Graduates in special education serve as key members of child study teams and are prepared to address educational, emotional, and physical disabilities. They also find employment as educational therapists, psycho-educational diagnosticians, and special education teachers and staff members in public and private schools.

Admission. Admission to the graduate program in special education is granted by the department's graduate program director in conjunction with special education faculty. The following requirements are necessary for admission to the licensure program. Individuals who have a non-teaching B.S. or B.A. and wish to earn an M.S. Ed. and qualify for a teaching license in special education must meet the liberal arts and sciences content requirements.

Regular admittance requirements:

1. a baccalaureate degree from any accredited institution that meets the Virginia Department of Education stated liberal arts/sciences competencies in the following areas: English, Mathematics, Science, History Social Science, Arts and Humanities, and Computer/Technology;
2. an undergraduate grade point average of 2.80 or better;
3. a Graduate Record Exam (GRE) score of at least 900 (verbal and quantitative sections with a minimum verbal component of 450), and 4.5 on the analytical writing section OR a Miller Analogies Test (MAT) minimum score of 400;
4. a 400-500 word goal statement indicating why the student wishes to enroll in the special education program; and,
5. successful completion of the Praxis I, SAT or ACT exam, as determined by the Virginia Department of Education.

Provisional admittance requirements:

1. a baccalaureate degree from any accredited institution that meets the Virginia Department of Education stated liberal arts/sciences competencies in the following areas: English, Mathematics, Science,

History, Social Science, Arts and Humanities, and Computer/Technology;

2. an undergraduate grade point average of 2.80 or better;
3. a Graduate Record Exam (GRE) score of at least 800 (verbal and quantitative sections with a minimum verbal component of 400), and 4.0 on the analytical writing section OR a Miller Analogies Test (MAT) minimum score of 396;
4. a 400-500 word goal statement indicating why the student wishes to enroll in the special education program; and,
5. successful completion of the Praxis I, SAT or ACT exam, as determined by the Virginia Department of Education.

Fast Track Teacher Preparation Admission Policy. Please refer to the appropriate section in the undergraduate catalog.

Continuance. Students must:

1. maintain a grade point average of 3.00 overall, and
2. successfully complete all competencies relative to their area of emphasis.
3. receive a B or better in all practicum courses prior to internship/student teaching.
4. achieve passing scores on the Virginia Communication and Literacy Assessment and the Virginia Reading Assessment will be required by the Virginia Department of Education for licensure and must be obtained prior to internship and student teaching.

Exit. Students must:

1. have a grade point average of 3.00 overall and a grade of B- or better in all course work;
2. satisfactorily complete all program requirements, including undergraduate content hour deficiencies or passing scores on Praxis II: Elementary Education content knowledge, the comprehensive examination and internship/student teaching experience;
3. complete a Graduate Student Assessment;
4. complete the Post Task Rating Form online at <http://education.odu.edu/esse/>;
5. submit a professional portfolio according to program guidelines prior to the awarding of the master's degree in special education.

Comprehensive Examination. All students seeking a master's degree in special education are required to complete successfully a written comprehensive examination. On this examination, students will be required to answer questions in general special education and questions from their areas of specialization. Specialization questions will be congruent with the student's academic and professional preparation. If not passed during the first administration, students may repeat the exam only one time. Failure to successfully pass the comprehensive examination will result in not completing the requirements for the Master of Science in Education.

Program Requirements

For all students who have the prerequisite undergraduate course work in special education, the master's degree requires a minimum of 30 semester hours of graduate study in special education to complete licensure. Students are expected to demonstrate dedication to special education clients and to programming in classroom and clinical settings before graduation is certified.

Special Education, K-12 Licensure – General Curriculum K-12

This program is designed to prepare professionals who are able to design and to implement appropriate educational programs for students who manifest mild disabilities. The program combines course work, supervised practica and internship to facilitate the integration of theory and practice in the development of evidence-based interventions applicable for individuals with special needs from preschool through adult in both public and private facilities. Program competencies prepare students to work in school-based programs, clinics, hospitals, and agency settings. Program practica and internship allow students opportunities to apply management, instructional and problem-solving skills in one-to-one and group settings.

Curriculum

Prerequisite Courses (or Undergraduate Minor or IDS in special education)

ESSE 313	Fundamentals of Human Growth and Development: Birth through Adolescence	3
ESSE 400/500	Foundations of Special Education: Legal Aspects and Characteristics	3
ESSE 402/502	Instructional Design I: Learner Characteristics and Assessment	3

ESSE 411/511	Classroom and Behavior Management Techniques for Students with Diverse Needs	3
ESSE 415/515*	Instructional Design II: Curricular Procedures and Individualized Education Planning	3
ESSE 417/517	Collaboration & Transitions	3
ECI 468/568	Language Acquisition and Reading	3
ECI 430/530	Instructional Technology and the Classroom	3

Graduate Course Work

Two of the following – Total 6 credits

ESSE 618*	Characteristics & Advanced Procedures: Emotional & Behavioral Disorders	3
ESSE 623*	Characteristics & Advanced Procedures: Mental Retardation	3
ESSE 625	Characteristics of Teaching Students with Autism Spectrum Disorders	3
ESSE 626*	Characteristics & Advanced Procedures: Learning Disabilities	3
ESSE 627*	Instructional Strategies/Students with Autism Spectrum Disorders	3

Both of the following – Total 6 credits

ESSE 714/814*	Alternative Strategies for Secondary Level Students	3
ESSE 715/815*	Alternative Strategies for Elementary Students: Prevention and Early Intervention	3

One of the following - 3 credits

ECI 680	Reading to Learn Across the Curriculum	3
ECI 683	Diagnostic Teaching of Reading in the Classroom	3

Required –15 credits

ESSE 586	Teacher Candidate Internship for Special Endorsement	9
ESSE 621*	Effective Interventions for Children and Youth with Challenging Behavior	3
ESSE 720	Curriculum and Instruction: Research into Practice	3

*Requires a practicum of 45 hours and passing scores on Praxis I or equivalent exemption. (See Practicum Experiences Policy)

Special Education, K-12 Licensure - Early Childhood Special Education and Special Education - Adapted Curriculum K - 12

The early childhood special education program is designed to prepare students to teach children from birth to age six who manifest disabilities or who are at risk of later school failure. Students endorsed in the area of early childhood special education will be eligible to teach in infant and preschool programs in both public and private settings. The adapted curriculum program is designed to prepare teachers to instruct individuals traditionally labeled with moderate, severe, or profound disabilities who may have disabling conditions such as cerebral palsy, autism, or a sensory impairment.

Curriculum

Prerequisite Courses (or Undergraduate Minor or IDS in special education)

ESSE 313	Fundamentals of Human Growth and Development: Birth - Adolescence	3
ESSE 400/500	Foundations of Special Education: Legal Aspects and Characteristics	3
ESSE 402/502	Instructional Design I: Learner Characteristics and Assessment	3
ESSE 411/511	Classroom and Behavior Management Techniques for Students with Diverse Needs	3
ESSE 415/515*	Instructional Design II: Curricular Procedures and Individualized Education Planning	3
ESSE 417/517	Collaboration & Transitions	3
ECI 430/530	Instructional Technology and the Classroom	3
Graduate Core Courses - 12 credits		
ESSE 504	Medical Aspects of Disabling Conditions	3
ESSE 569	Communication/Language Development and Intervention Strategies	3
ESSE 633*	Sensorimotor Development and Intervention Strategies	3
ECI 568	Language Acquisition and Reading for Students with Diverse Learning Needs	3

*Requires a 45-hour practicum and passing scores on Praxis I.

Early Childhood Special Education - 9 credits

ESSE 630*	Teaching Preschoolers with Disabilities	3
ESSE 631*	Developmental and Ecological Assessment Strategies	3
ESSE 637*	Infant/Family Intervention and Teamwork	3

*Requires a 45-hour practicum and passing scores on Praxis I.

Special Education--Adapted Curriculum K – 12 - 9 credits

ESSE 621*	Effective Intervention for Children and Youth with Challenging Behavior	3
ESSE 623*	Characteristics & Advanced Procedures: Mental Retardation <i>or</i> Teaching Students with Autism Spectrum Disorders	3
ESSE 625	Teaching Students with Severe Disabilities	3

*Requires a 45-hour practicum and passing scores on Praxis I or equivalent exemption. (See Practicum Experiences Policy)

Internship – 9 credits

ESSE 586	Teacher Candidate Internship for Special Endorsement	9
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Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in the catalog. Students are encouraged to obtain current program information from their advisors and the Darden College of Education website at <http://education.odu.edu/>.

Special Education Licensure Only

Cheryl S. Baker, Graduate Program Director

Many students who already possess an undergraduate degree enter Old Dominion University for the sole purpose of meeting Virginia's teaching licensure standards. When these students apply for admission into an approved teacher education program, they are considered to be "licensure only" candidates and must meet the college's policy for admitting students into an approved teacher education program. Admission to Old Dominion University does not guarantee admission into degree and/ or teacher preparation programs in the Darden College of Education. The special education licensure only option is available for those students who wish to pursue endorsement in special education and do not meet the master's degree admission requirements or hold provisional licensure in special education and wish to complete licensure requirements.

The Special Education Teacher Licensure Only Program meets Virginia Department of Education endorsement requirements. Graduates find employment as special education teachers within the continuum of services provided for children with special needs and may also serve as key members of child study teams; they are prepared to address the educational, emotional, and physical needs of students with disabilities.

Admission. Regular admittance requires:

1. admission to Old Dominion University as a non-degree seeking graduate;
2. cumulative GPA of 2.8 for all college credit courses taken in the baccalaureate degree program;
3. successful completion of the Praxis I, SAT or ACT exam, as determined by the Virginia Department of Education;
4. an interview and recommendation for admittance from a department representative, Teacher Education Services advisor, or site director; and
5. submission of an application for admittance into the Darden College of Education Teacher "Licensure Only" Program.

Provisional admittance requires:

1. admission to Old Dominion University as a non-degree seeking graduate student;
2. cumulative GPA of 2.79 for all college credit courses taken in the baccalaureate degree program;
3. successful completion of the Praxis I, SAT or ACT exam, as determined by the Virginia Department of Education;
4. an interview and recommendation for admittance from a department representative, Teacher Education Services advisor, or site director; and
5. submission of an application for admittance into the Darden College of Education Teacher Licensure Only Program.

Continuance and Exit. Requirements are:

1. successful completion of all courses required for licensure in an endorsement area including undergraduate liberal arts and sciences content or passing scores on Praxis II: Elementary Education Content Knowledge;
2. maintenance of a GPA of 3.0 with a B- or better in all course work and a B or better in all practicum courses prior to internship/student teaching;
3. passing scores on the Virginia Communication and Literacy Assessment and the Virginia Reading Assessment will be required by the Virginia Department of Education for licensure and must be obtained prior to internship/student teaching, and;

4. passing scores on the Special Education Exit Exam.

Curriculum**Special Education Licensure Only—General Curriculum, K - 12**

ESSE 313	Fundamentals of Human Growth and Development	3
ESSE 400/500	Foundations of Special Education: Legal Aspects and Characteristics	3
ESSE 402/502	Instructional Design I: Learner Characteristics and Assessment	3
ESSE 411/511	Classroom and Behavior Management Techniques for Students with Diverse Needs	3
ESSE 415/515*	Instructional Design II: Curricular Procedures and Individualized Education Planning	3
ESSE 417/517	Collaboration & Transitions	3
ECI 468/568	Language Acquisition and Reading	3
ESSE 714*	Alternative Strategies for Secondary Level Students <i>or</i>	3
ESSE 715*	Alternative Strategies for Elementary Students	3
ECI 680	Reading to Learn Across the Curriculum	3
ECI 430/530	Instructional Technology and the Classroom , PK-12	3

Internship

ESSE 586	Teacher Candidate Internship for Special Endorsement	9
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* Requires a practicum of 45 hours and passing scores on Praxis I or equivalent exemption. (See Practicum Experiences Policy)

Early Childhood Special Education/Special Education—Adapted Curriculum, K - 12 Licensure Only; Early Childhood Special Education**Core Requirements**

ESSE 313	Fundamentals of Human Growth & Development	3
ESSE 400/500	Foundations of Special Education: Legal Aspects and Characteristics	3
ESSE 415/515*	Instructional Design II: Curricular Procedures and Individualized Education Planning	3
ESSE 404/504	Medical Aspects of Disabling Conditions	3
ESSE 411/511	Classroom and Behavior Management Techniques for Students with Diverse Needs	3
ESSE 417/517	Collaboration & Transitions	3
ESSE 469/569	Communication/Language Development and Intervention Strategies	3
ECI 468/568	Language Acquisition and Reading	3
ECI 430/530	Instructional Technology and the Classroom PK-12	3

Early Childhood Special Education Licensure Only

ESSE 630*	Teaching Preschoolers with Disabilities	3
ESSE 631*	Developmental and Ecological Assessment Strategies	3
ESSE 637*	Infant/Family Intervention and Teamwork	3

*Requires practicum of 45 hours and passing scores on Praxis I.

Internship

ESSE 586	Teacher Candidate Internship for Special Endorsement	9
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Special Education—Adapted Curriculum, K - 12 Licensure Only

ESSE 621*	Effective Interventions for Children and Youth with Challenging Behavior	3
ESSE 633*	Sensorimotor Development and Intervention Strategies	3
ESSE 628*	Teaching Students with Severe Disabilities	3

*Requires practicum of 45 hours and passing scores on Praxis I or equivalent exemption. (See Practicum Experiences Policy)

Internship

ESSE 586	Teacher Candidate Internship for Special Endorsement	9
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Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in the catalog. Students are encouraged to obtain current program information from their advisors and the Darden College of Education website at <http://education.odu.edu/>.

Special Education – Visual Impairments, PreK-12 Licensure only Endorsement Requirements

ESSE 400/500	Foundations of Special Education: Legal Aspects and Characteristics	3
ESSE 411/511	Classroom and Behavior Management Techniques for Students with Diverse Needs	3
ESSE 417/517	Collaboration & Transition	3
ESSE 432/532	Characteristics of Students with Visual Impairments	1
ESSE 433/533	Braille Code	3
ESSE 434/534	Medical and Educational Implications of Visual Impairments	3
ESSE 435/535	Orientation and Mobility	2
ESSE 436/536	Curriculum and Assessment of Students with Visual Impairments	3

ESSE 437/537	Assistive Technology for Individuals with Sensory Impairments	2
ECI 468/568	Language Acquisition and Reading	3
ESSE 638	Teaching Methods for Students with Visual Impairments	3
ESSE 639	Braille Reading & Writing	3
Internship		
ESSE 586	Teacher Candidate Internship for Special Endorsement	6
Portfolios		
ESSE 669	Directed Field Project in ESSE (Midpoint Portfolio)	1
ESSE 669	Directed Field Project in ESSE (Final Portfolio)	1

Autism Certificate Program

Old Dominion University is pleased to offer a 12 credit hour certificate program designed to prepare teachers and related service providers to effectively work and provide support for students with autism spectrum disorder (ASD). This coursework can be completed separately from, or integrated into, the Master's Degree in Special Education. Virginia teachers enrolled in the ODU Certificate in Teaching Students with Autism may be reimbursed for courses by the Virginia Department of Education.

Required Courses:

ESSE 625	Characteristics of Students with Autism Spectrum Disorders
ESSE 627*	Instructional Strategies for Students with Autism Spectrum Disorders
ESSE 569	Communication/Language Development and Intervention Strategies
ESSE 621*	Effective Intervention of Children and Youth with Challenging Behavior

*Requires a practicum of 45 hours and passing scores on Praxis 1 or equivalent exemption. (See Practicum Experiences Policy)

Doctor of Philosophy in Education – Special Education Emphasis

Cheryl S. Baker, Graduate Program Director

The Doctor of Philosophy is the degree most often desired for those who wish to become faculty in colleges and universities and those who aspire to senior administrative roles in institutions and agencies. The Ph.D. in special education is intended to prepare individuals for administrative and faculty positions and to provide students with the skills to carry out scholarly research, lead organizations, and create new research.

The Ph.D. in special education is designed to address the acute shortage of doctoral level special education personnel in the Commonwealth and across the nation. Program graduates will be prepared as content experts in pre-referral intervention and early intervention to assume positions of leadership as special education faculty at the university and college level. Additionally, graduates of the special education program will have the professional research skills to work with school systems to address the diverse learning needs and behavior challenges associated with the education of students with special needs and those students at risk. Program graduates will attain a degree of proficiency in research and writing that will prepare them to make contributions to the professional literatures of special education and related disciplines.

The curriculum described below contains elements that will provide research expertise, administrative skills and experience, and the ability to serve the nation's colleges, universities, and agencies providing special education services.

Admission. The criteria for admission into the Ph.D. in special education will include:

1. A completed master's degree in special education or an equivalent degree, in an appropriate discipline in a program that is accredited by an appropriate specialized accrediting agency and from an institution of higher education that is regionally accredited. A minimum grade point (GPA) of 3.60 (on a 4.0 scale) overall for the master's degree and in the major area of study in the master's degree will be expected. In extraordinary circumstances, an individual may be accepted into the Ph.D. in special education program on a provisional status without having received a master's degree. This individual first must complete the master's degree in the selected concentration area and meet all other admission criteria prior to beginning Ph.D. coursework.
2. An acceptable overall total score on the Graduate Record Examination (minimum 550 on the verbal portion) and no less than a 4.5 on the writing sample. Applicants whose native language is not English must

submit a current score for the Test of English as a Foreign Language (TOEFL) that meets the University's current standard.

3. Submission of a professional vitae.
4. A 500-800 word statement of academic and professional goals. This statement must address how the applicant would work within the research agenda of the concentration to achieve his/her goals.
5. Three letters of reference from sources capable of commenting on the applicant's readiness for the advanced graduate study. At least two of these letters must be from an academic source.
6. Prior course work in statistics and in theories of learning. If this requirement is not met, a student may be admitted and additional course work will be added to the candidate's program of study.
7. An on-campus interview with concentration area faculty.

Applications for admission will be reviewed by the admissions committee from the special education concentration. Admission to the special education program is competitive with the number of applications expected to exceed the number of available openings. Admission criteria will be weighted with competitive applicants invited to participate in an on campus interview. Most full time students will begin their course of study each summer semester as a cohort following a summer orientation.

Continuance. Students must:

1. maintain a grade point average of 3.00 overall; and,
2. successfully complete all competencies relative to their program of study.

Exit. In order to complete the program, students must fully complete the curriculum below and all requirements noted elsewhere in the University catalog for graduate students and within the Ph.D. in Education Handbook. It is the responsibility of the student to obtain these materials and comply with all requirements.

Program Requirements

The Ph.D. program in special education is comprised of courses totaling a minimum of 60 academic credit hours beyond the master's degree. The curriculum includes a content concentration totaling 24 credit hours, an introductory core of nine hours, a research component including 15 credit hours, and the dissertation, which will include a minimum of 12 hours. The dissertation will often include more than 12 credit hours depending on the length of time necessary for completion. Students entering the program may also need to complete one introductory statistics course if they have not had such a course or cannot demonstrate competency at a satisfactory level. Students who come into the Ph.D. program with a master's degree in an academic field that is unrelated to special education and/or who have not completed courses to develop competency in specified areas may need to complete additional prerequisite course work.

Under normal circumstances, admissions will be offered once a year in order to build efficient cohort groups for this type of advanced study. In order to enhance the experience of the students and to increase the efficiency by which courses are offered, a cohort of 10 students will be admitted each year. This limited number of students is necessary to ensure that there is an adequate number of full-time faculty to serve the students through advising and other duties, particularly when the cohorts reach the dissertation stage of the program.

To build a cohesive cohort group, a series of intensive courses will be offered on the Old Dominion University campus each summer. It is expected that all newly admitted students will come to campus for one of these seminars during the summer after they are admitted to the program and complete two courses together as a group. These courses will be selected from the introductory core requirements. A third course will be available for regular study during the summer so that students may comply with one of the residency requirements.

A minimum of two semesters of full-time study is required of students in the program to meet University residency requirements. One of the semesters of full-time study (defined as completion of nine credit hours) must be accomplished by the completion of the intensive seminar noted above. The second semester of residency can be accomplished in several ways. Courses taken via TELETECHNET or other distance education methodologies are considered "resident" courses, so that taking three TELETECHNET courses during a semester may complete the second residency requirement.

Applicants must submit completed applications and all related material no later than March 1 of each year, and students will be admitted for study beginning in June or July of the same year.

Curriculum

Prerequisite Course work - 6 credits

ELS 732	Statistics Applied to Research in Education & Human Services I
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ESSE 701/801	Historical & Contemporary Research in Special Education	3
Introductory Core - 9 credits		
ESSE 821	Critical Issues I: Readings in Special Education & Professional Writing	3
ESSE 822	Critical Issues II: Research and Professional Writing	3
ESSE 893	Professional Seminar: Teaching, Research, & Service	3
Research Core - 15 credits		
ELS 832	Statistics Applied to Research in Education & Human Services II	3
ELS 833	Advanced Research Design & Analysis	3
ELS 881	Advanced Program Evaluation and Assessment	3
ECI 890	Qualitative Research Design	3
ESSE 830	Single Subject Research	3
Special Education Concentration - 24 credits*		
ESSE 700/800	Social/Emotional Aspects of Child Development	3
ESSE 702/802	Cognitive Processes & Learning Strategies for Students with Special Needs	3
ESSE 707/807	Advanced Instructional Procedures in Special Education	3
ESSE 715/815	Alternative Strategies for Elementary Students: Prevention and Intervention	3
ESSE 720/820	Curriculum/Instruction: Research Into Practice	3
ESSE 795/895	Topics in Education	3
ESSE 868	Internship: Urban Child Study/Special Education	3
ELS 815	Leadership for Equity and Inclusive Education	3
Dissertation - 12 credits		
ESSE 899	Dissertation	12

*With approval of the graduate program director, elective courses may be substituted for those within the special education core. This allows students to take up to 12 hours as electives. Such substitutions must be approved in writing. Electives may be taken in other areas in the College of Education (e.g., educational leadership, higher education, early childhood education, instructional design and technology) or in other colleges with the approval of the appropriate graduate program director or department.

Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in the catalog. Students are encouraged to obtain current program information from their advisors and the Darden College of Education website at <http://education.odu.edu/>.

Practicum Experiences Policy

A candidate may participate in a course with a practicum experience through one of two tracks:

- A. A candidate may be eligible to participate in the early practicum experience course if s/he has been admitted into an approved teacher education program. This requires that candidates pass the PRAXIS 1 exam or meet Virginia Board of Education approved cut-off scores for the SAT or ACT. In addition, candidates must meet the GPA for their individual programs, professional education courses, and minimum grade requirements, along with any other course prerequisites.
- B. A provisionally licensed teacher may participate in an early practicum course if s/he is currently employed with a school division, have a letter from the Virginia Department of Education listing the course as a needed requirement, and have passing Virginia Communication and Literacy Assessment (VCLA) scores. The provisionally licensed teacher will have to meet all the requirements of the course as stated in the syllabus.

Master of Science in Education - Speech-Language Pathology

Child Study Center
757-683-4117

Nicholas G. Bountress, Graduate Program Director

This program leads to a Master of Science in Education with a major in speech-language pathology. The program is accredited by the American Speech-Language and Hearing Association (ASHA) and is intended to prepare professionals to understand, identify, assess and prepare intervention programs for children and adults who present a wide array of speech and language

disorders. Content areas of coursework include language development and disorders, articulation and phonological disorders, voice disorders, fluency disorders, hearing disorders and evaluation, dysphasia, aphasia, motor speech disorders, orofacial disorders and social dialects, among others. Students engage in supervised on-campus practica in the university Speech and Hearing Clinic/Scottish Rite Center for Childhood Speech and Language Disorders. They also engage in off-campus practica in a wide variety of area hospitals, private practice settings, rehabilitation centers, clinics and public schools. Each graduate student also completes a research paper in an area of their interest under the supervision of a program faculty member and must successfully pass a written comprehensive examination. All students must complete the national examination in Speech-Language Pathology (Praxis II) and essential paperwork for ASHA certification prior to graduation.

Graduates of the program hold positions as speech-language pathologists in a variety of professional settings, such as hospitals, children's hospitals, private practice agencies, medical schools, rehabilitation centers and public schools. Many graduates have become administrators, clinical supervisors and instructors at universities, and researchers.

Students with and without an undergraduate degree in speech-language pathology are eligible for acceptance into the program. The normal matriculation for a student who holds an undergraduate degree in the field is two full years of full-time enrollment. Students who do not hold an undergraduate degree in the field typically require two additional semesters to complete prerequisite and required master's degree coursework.

Admission

Admission to the graduate program in speech-language pathology is granted by the department's graduate program director with the advisement of the speech-language pathology faculty. Individuals entering the master's degree program must possess an undergraduate degree.

The following requirements are necessary in order to be considered for admission to the program.

Regular admittance requires:

1. a baccalaureate degree from an institution accredited by a regional accrediting body or an equivalent degree from a foreign institution;
2. an undergraduate grade point average of 2.80 or better;
3. a Graduate Record Examination (GRE) score of 400, minimum, on the verbal section and 4.0, minimum, on the analytical section. Students meeting these minimal scores enter a selection pool of candidates;
4. three letters of recommendation, at least two of which should be from prior university instructors;
5. a 400-500 word essay indicating the student's academic and professional goals as well as a description of the reasons the student believes he or she is a competitive candidate.

Continuance. Students must:

1. maintain a grade point average of 3.00;
2. satisfactorily complete all practica
3. earn no more than two grades below B-. Students must retake courses in which grades below B- are earned and receive grades of B- or higher. Obtaining three grades below B- leads to expulsion from the program.
4. meet prerequisite competencies, including the Grammatical Categories Test, in order to be admitted to clinical practica;
5. receive permission from the faculty in order to be admitted to any clinical practicum;

Exit. Students must:

1. have a grade point average of 3.00;
2. pass the department writing proficiency examination;
3. meet all academic competencies;
4. meet all clinical competencies;
5. pass a written comprehensive examination;
6. complete Praxis II (Speech-Language Pathology);
7. successfully complete a written research project; and,
8. complete an exit interview with the graduate program director.

Comprehensive Examination

All students seeking a master's degree in speech-language pathology are required to successfully complete a written comprehensive examination. Areas of examination are based upon program coursework and related areas of professional preparation. If any area is not successfully completed during the first administration, the student is allowed only one more attempt. Failure of any question on the second administration leads to expulsion from the program.

Program Requirements

All students who have met prerequisite requirements must complete a minimum of 36 semester hours of graduate study in speech-language

pathology. Students are expected to satisfy all professional, academic and clinical requirements and demonstrate ethical and interactive behaviors commensurate with the standards of the profession.

Curriculum

Prerequisite Courses - 36 credits

ESSE 351	Anatomy of Speech, Language and Hearing	3
ESSE 352	Phonetics	3
ESSE 447	Language Disorders	3
ESSE 449	Pre-Clinical Competencies	3
ESSE 450	Survey of Communication Disorders	3
ESSE 451	Articulation and Phonological Disorders	3
ESSE 452	Voice Disorders	3
ESSE 453	Language Development	3
ESSE 458	Speech and Hearing Science	3
ESSE 459	Seminar/Methods and Materials	3
ESSE 460	Audiometry and Hearing Disorders	3
ESSE 461	Aural Rehabilitation	3

Required Courses - 58 credits

ESSE 549	Pre-Clinical Competencies	3
ESSE 554	Practica in Speech-Language Pathology	4
ESSE 557	Language Diagnosis and Remediation	3
ESSE 597	Independent Study in Special Topics in Education	1-3
ESSE 635	Research Methods in Education	3
ESSE 636	Problems in Education	3
ESSE 650	Organic Speech Disorders	3
ESSE 651	Language Development and Disorders	3
ESSE 652	Articulation and Phonological Disorders	3
ESSE 654	Advanced Clinical Techniques	3
ESSE 655	Cleft Palate	3
ESSE 656	Theories and Therapies in Stuttering	3
ESSE 657	Aphasia	3
ESSE 658	Swallowing Disorders	3
ESSE 660	Procedures in Audiology	3

The master's, education specialist, and doctor of philosophy degrees may be designed to meet the requirement for becoming an LPC in Virginia or a licensed school counselor in Virginia.

Specialties within the master's degree program include college counseling, community counseling, mental health counseling, and school counseling. The master's degree program offers a curriculum that emphasizes the following core components: professional orientation and ethical practice; social and cultural diversity; human growth and development; career development; helping relationships; group work; assessment; and research and program evaluation. In addition, coursework specific to a counseling specialty is required. The program aims to stimulate within students social advocacy and systems understanding in order to reduce disparities among groups. Field placement experiences (practicum and internship) are required to assure that students are able to apply the counseling skills and knowledge they learned in the courses they completed to help clients. The admissions process, the use of experimental and didactic learning approaches, and the ongoing evaluation of students ensures that counseling students possess the personal characteristics necessary to be effective counselors.

The community counseling and mental health counseling specialty areas prepare graduate students for careers in community mental health settings and in private practice. The community counseling specialty differs from the mental health counseling specialty in that 48 credits are required in the community counseling specialty and 60 credits are required in the mental health counseling specialty. The mental health counseling specialty includes an emphasis on diagnosis and treatment planning, psychopharmacology, and psychopathology. The program of study in the mental health counseling specialty includes all of the courses necessary to achieve licensure as a Licensed Professional Counselor (LPC) in Virginia. The school counseling specialty area engages students in the acquisition and application of knowledge relevant to a new vision of school counseling. Through content and experiential learning in both classroom settings and in the schools, graduate students are prepared to become school counselors who are systemic thinkers, leaders, partnership builders, advocates for children, and proactive professionals who embrace the belief that all children are capable of achieving at high levels. By defining the roles and functions of the school counselor in innovative ways, this new paradigm in school counseling stresses the concepts that school counselors are a major force in closing the *achievement gap* and that changes in students and programs will be observable and measurable. The program of study in the school counseling specialty includes all of the courses and experiences necessary to achieve licensure as a school counselor in Virginia. The college counseling specialty prepares counselors to work in institutions of higher education including community colleges, technical colleges, four-year colleges, and universities.

The education specialist (Ed.S.) degree extends counseling knowledge and skills for individuals who already hold master's degrees in counseling. The Ed.S. degree also provides core master's level counseling coursework for individuals who have master's degrees in other fields who wish to become counselors.

The Ph.D. in counseling prepares individuals for employment as counselor educator faculty members in colleges and universities, and as clinicians and leaders in counseling settings in colleges, community mental health agencies, private practices, and schools. This program provides doctoral students with the skills to supervise other counselors, teach counseling skills, conduct scholarly research, lead organizations, and create new knowledge in the field of counseling.

The master's degree program (including the four specializations) and the Ph.D. degree program on the Norfolk campus are accredited by the Council for the Accreditation of Counseling and Related Programs (CACREP). CACREP does not accredit education specialist degree programs. The mental health counseling and school counseling master's degree specializations offered at the New College Institute in Martinsville, Virginia are not accredited by CACREP. The New College Institute counseling master's degree program specializations in Martinsville, Virginia have been designed to meet CACREP standards and CACREP accreditation will be sought as soon as the program is ready to graduate its first students, which is a requirement for applying for CACREP accreditation. Objectives for programs offered and other important program information can be found in the program handbooks which are located on the program web pages at <http://education.odu.edu/elc/academics/counseling>.

Department of Counseling and Human Services

110 Education Building
757-683-4344

Theodore P. Remley, Jr., Chair

Counseling

- Master of Science in Education
 - School Counseling
 - Community Health Counseling
 - Education Specialist
- Doctor of Philosophy in Counseling
 - Clinical
 - School Counseling
 - Mental Health Counseling

Counseling Graduate Program

The counseling graduate program offers a master's degree, an education specialist degree, and a Ph.D. in counseling. The program also offers a non-degree LPC Track for individuals who hold master's degrees in counseling who wish to become Licensed Professional Counselors (LPCs). All of these degree programs and the LPC Track are offered on the Norfolk Campus. In addition, master's degree programs in mental health counseling and school counseling are offered at the New College Institute located in Martinsville, Virginia. The two master's degree programs at the New College Institute operate separately from the counseling graduate programs offered at the Norfolk Campus and those programs in Martinsville, Virginia have a separate faculty, admissions process, curriculum, and accreditation status.

Master of Science in Education-Counseling

110 Education Building
757-683-3326

Theodore P. Remley, Jr., Graduate Program Director, remley@odu.edu

Admission. Applicants may hold a bachelor's degree in any field.

Deadlines for Admission

- New students are admitted twice each year and are eligible to begin fall, spring, or summer semester.
- Fall Semester (or Summer Semester)
 - January 1 – Review of completed applications begins
 - March 1 – Deadline for completed applications
- For admission for summer semester (beginning early May) or fall semester (beginning mid-August), for review of completed applications will begin January 1 and the final deadline for receipt of applications is March 1. Applicants will be notified of admission decisions no later than mid-March.
- Spring Semester
 - September 1 – Review of completed applications begins
 - November 1 – Deadline for completed applications
- For admission for spring semester (beginning early January), review of completed applications will begin September 1 and the final deadline for receipt of applications is November 1. Applicants will be notified of admission decisions no later than mid-November.

Application Requirements

For details regarding the application process, criteria used to select students, materials required of applicants, where to send application materials, and taking courses prior to admission as a non-degree graduate student, see the program web site at <http://education.odu.edu/elc/academics/counseling>.

Continuance. Students must meet all university and program requirements to continue toward degree completion once they have been admitted.

Program Completion and Exit. Students must successfully complete a written comprehensive examination and the required course of study and must have a minimum GPA of 3.00 to graduate.

Program Requirements. A minimum of 48 semester credits is required for the Master of Science in Education with a specialty in college counseling, community counseling, or school counseling. A minimum of 60 semester credits is required for the Master of Science in Education with a specialty in mental health counseling. Toward the conclusion of the program, all students must pass a comprehensive exam. All students are required to take 33 credits of common-core course work. Additional course work in specialty areas is required. All students complete a practicum and internship.

Curriculum

Core Courses (33 credits)

COUN 601	Principles of Professional Counseling and Ethics	3
COUN 631	Counseling for Lifespan Development	3
COUN 633	Counseling and Psychotherapy Techniques	3
COUN 634	Advanced Counseling and Psychotherapy Techniques	3
COUN 635	Research and Program Evaluation	3
COUN 644	Group Counseling and Psychotherapy	3
(school counseling specialty students may substitute COUN 642)		
COUN 645	Testing and Client Assessment	3
COUN 648	Foundations of Career Development	3
COUN 650	Theories of Counseling and Psychotherapy	3
COUN 655	Social/Cultural Issues in Counseling	3
COUN 669	Practicum in Counseling (100 hrs min)	3

Specialty Courses and Electives

College Counseling – 15 credits

COUN 685	Diagnosis and Treatment Planning in Mental Health Counseling	3
COUN 707	Adult and College Student Development	3
HIED 710	Introduction to Student Affairs	3
COUN 666	Internship in College Counseling (600 hrs minimum)	6

Community Counseling – 15 credits

COUN 680	Mental Health Counseling	3
COUN 685	Diagnosis and Treatment Planning in Mental Health Counseling	3
COUN 667	Internship in School Counseling (600 hrs minimum)	6
COUN Electives		3

Mental Health Counseling - 27 credits.

COUN 647	Addictive Disorders	3
COUN 670	Introduction to Counseling Supervision	3
COUN 680	Mental Health Counseling	3

COUN 685	Diagnosis and Treatment Planning in Mental Health Counseling	3
COUN 691	Family Systems and Family Development	3
COUN 667	Internship in Mental Health Counseling (900 hrs minimum)	3
COUN Electives		3
School Counseling - 15 credits.		
COUN 676	Professional Issues in School Counseling K-12	3
COUN 678	Counseling Children & Adolescents in School Settings	3
COUN 679	School Counseling Program Development K-12	3
COUN 668	Internship in School Counseling (600 hrs minimum)	6

Education Specialist–Counseling

110 Education Building
757-683-3326

Theodore P. Remley, Jr., Graduate Program Director, remley@odu.edu

The Education Specialist (Ed.S.) degree in counseling is designed to further develop and broaden students' knowledge and skills in counseling and to cultivate their capacity for leadership as professionals. The Ed.S. is suitable for master's degree level counselors who wish to earn an additional graduate degree in counseling, or for individuals with master's degrees in related fields who wish to satisfy the academic portion of the state requirements for licensure as a professional counselor. It is considered a terminal counseling practitioner's degree.

Admission. Applicants must have a master's degree. Applicants must submit an ODU Graduate School application, official transcripts from all universities previously attended, letters of recommendation, an essay, and GRE scores taken within the last 5 years. (The GRE score requirements is waived for applicants who hold a graduate degree from ODU). All materials must be submitted to the ODU Graduate Admissions Office. There are no deadlines for applications. Applications are reviewed once they are complete and applicants are informed of application decisions soon after complete applications have been submitted. Detailed information regarding materials that must be submitted to apply and criteria used to select students are found on the program web page.

Non-matriculated or non-degree status. Students may take a maximum of 6 credits beyond their master's degree as a non-matriculated or non-degree student before being admitted into the program.

Continuance. Students must meet all University requirements. If faculty members have serious concerns about a student's satisfactory progress in the program, they may initiate a process that could lead to the student being asked to withdraw. Students have the right to appeal decisions made by faculty.

Exit. Students must successfully complete the required course of study (30 credits) with a grade point average of 3.00 or better, and pass a written comprehensive examination.

Program Requirements. The Education Specialist degree in counseling requires a minimum of 30 semester hours of course work beyond the master's degree. At least 18 of the 30 credits must be at the 700 or 800 level.

Required Courses

Required courses may have been completed as part of a previous master's degree program, but only credits earned after earning a master's degree may be transferred into the Ed.S. program.

COUN 601	Principles of Professional Counseling and Ethics	3
COUN 631	Counseling for Lifespan Development	3
COUN 633	Counseling and Psychotherapy Techniques	3
COUN 635	Research and Program Evaluation OR	
ELS 833	Advanced Research Design and Analysis	3
COUN 644	Group Counseling and Psychotherapy OR	
COUN 642	Structured Counseling Groups	3
COUN 645	Testing and Client Assessment	3
COUN 647	Addictive Disorders OR	
COUN 747/847	Chemical Dependency Counseling	3
COUN 648	Foundations of Career Development	3
COUN 650	Theories of Counseling and Psychotherapy	3
COUN 655	Social and Cultural Issues in Counseling	3
COUN 685	Diagnosis and Treatment Planning in Mental Health Counseling OR	
COUN 840	Advanced Diagnosis and Treatment Planning	3
COUN 691	Family Systems and Family Development OR	
COUN 781/881	Family Therapy	3
COUN 665, 666, 667, 668 or 868	Internship (600 hrs min)	6

Professional Counselor (LPC) Track

110 Education Building
757-683-3326

Theodore P. Remley, Jr., Graduate Program Director, tremley@odu.edu

The purpose of the Licensed Professional Counselor track is to provide individuals with the academic preparation for eventual licensure. Individuals who need to take specific courses to become licensed may request permission from the Graduate Program Director to take courses as a non-degree graduate student and do not need to apply to the LPC Track. Individuals who need to complete an internship to become licensed must be apply to the LPC Track and must be admitted before they will be allowed to register for an internship. Individuals must apply to the LPC track using the form found on the program web site. The admission process is internal to the program, so applicants submit LPC Track applications directly to the Graduate Program Director instead of to the ODU Graduate Admissions Office. There are no deadlines for applications. Applications are reviewed once they are complete and applicants are informed of application decisions soon after complete applications have been submitted. When the student is admitted, the student's advisor, who is normally the Graduate Program Director, will work with the student to plan his or her curriculum

Required Courses

Required courses may have been completed as part of a previous master's degree program, only courses completed post-master's may be applied to the Ed.S. degree requirements.

COUN 601	Principles of Professional Counseling and Ethics	3
COUN 631	Counseling for Lifespan Development	3
COUN 633	Counseling and Psychotherapy Techniques	3
COUN 635	Research and Program Evaluation OR	
ELS 833	Advanced Research Design and Analysis	3
COUN 644	Group Counseling and Psychotherapy OR	
COUN 642	Structured Counseling Groups	3
COUN 645	Testing and Client Assessment	3
COUN 647	Addictive Disorders <i>or</i>	
COUN 747/847	Chemical Dependency Counseling	3
COUN 648	Foundations of Career Development	3
COUN 650	Theories of Counseling and Psychotherapy	3
COUN 655	Social and Cultural Issues in Counseling	3
COUN 685	Diagnosis and Treatment Planning in Mental Health Counseling OR	
COUN 840	Advanced Diagnosis and Treatment Planning	3
COUN 691	Family Systems and Family Development OR	
COUN 781/881	Family Therapy	3
COUN 665, 666, 667, 668 or 868	Internship (600 hours minimum)	6

Doctor of Philosophy in Education – Counseling Emphasis

110 Education Building
757-683-3326

Theodore P. Remley, Jr., Graduate Program Director, tremley@odu.edu

The Doctor of Philosophy is the degree most often desired for those who wish to become faculty members in American colleges and universities and leaders in schools and agencies. The Ph.D. in counseling is intended to prepare individuals for employment as counselor educators in colleges and universities, clinicians in private practice and mental health agencies, and for counseling leadership positions in the public schools. This program provides doctoral students with the skills to carry out scholarly research, lead organizations, and create new knowledge.

Admission.

Deadlines for Admission

- February 1 and October 1 of each year
- New students are admitted twice year and are eligible to begin fall, spring, or summer semester
- To begin fall or summer semester
 - December 1 – Review of completed applications begins
 - February 1 – Deadline for completed applications
- For admission for summer semester (beginning early May) or fall semester (beginning mid-August), review of completed applications will begin December 1 and the final deadline for receipt of

applications is February 1. Applicants will be notified of whether they are finalists for admission no later than mid-February.

- To begin spring semester
 - August 1 – Review of completed applications begins
 - October 1 – Deadline for completed applications
- For admission for spring semester (beginning early January), review of completed applications will begin August 1 and the final deadline for receipt of applications is October 1. Applicants will be notified of whether they are finalists for admission no later than mid-October.

For details regarding the application process, criteria used to select students, materials required of applicants, and where to send application materials, see the program website at <http://education.odu.edu/elc/academics/counseling>.

Program Course Requirements. The Ph.D. program in counseling is comprised of courses totaling a minimum of 60 academic credit hours beyond the master's degree. The curriculum includes advanced courses in counseling, supervision, teaching, and research, a doctoral practicum and internship, and 12 credits of dissertation.

Program Completion and Exit. In order to complete the program, students must complete required courses in a satisfactory manner, pass examinations, and complete an acceptable dissertation. Ph.D. students must meet all requirements included in the University Graduate Catalog, the Ph.D. in Education Handbook, and the Counseling Ph.D. Program Handbook. It is the responsibility of the student to obtain these documents and complete requirements.

Prerequisites

Graduation from a master's degree program in counseling that was accredited by the Council on Accreditation of Counseling and Related Educational Programs (CACREP) is a prerequisite. If a doctoral student's master's degree program was not accredited by CACREP, the student must take master's-level courses and field experiences they are missing as a part of their Ph.D. program. Two courses (or their equivalent) must be completed prior to entering the Ph.D. program or must be taken early in the Ph.D. program:

COUN 670	Introduction to Supervision in Counseling	3
ELS 732	Statistics Applied to Research in Education and Human Services I	3

Required Course – 60 credits

COUN 801	Current Issues in Counseling and Counselor Education	3
COUN 820	Counselor Education Teaching and Practice	3
COUN 835	Advanced Counseling Research & Program Evaluation	3
COUN 842	Advanced Counseling Theory and Practice	3
COUN 846	Supervision in Counseling	3
COUN 844	Advanced Group Counseling	3
COUN 848	Multicultural Perspectives in Counselor Education, Supervision, and Research	3
COUN 868	Internship in Counseling	6
COUN 869	Advanced Supervised Practicum in Counseling	3
COUN 898	Dissertation Seminar	3
COUN 899	Dissertation	12
COUN	Electives	6
ECI 890	Qualitative Research Design	3
ELS 832	Statistics Applied to Research in Education and Human Services II	3
ELS 833	Advanced Research Design and Analysis	3

Department of Educational Foundations and Leadership

120 Education Building
757-683-3326

TBD, Chair

The Department of Educational Foundations and Leadership offers graduate programs in community college leadership (Ph.D.), educational leadership (M.S.Ed., Ed.S., Ph.D.), and higher education (M.S.Ed., Ed.S., Ph.D.).

Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in the catalog. Students should obtain current program information from their advisors and the Darden College of Education website at <http://education.odu.edu/>.

Individual programs are described on the following pages:

Community College Leadership

- o Doctor of Philosophy in Community College Leadership

Educational Leadership

- o Master of Science in Education – Administration and Supervision
- o Master of Science in Education – Administration and Supervision with K-12 licensure
- o K-12 Licensure only
- o Education Specialist – Educational Leadership
- o Education Specialist – Educational Leadership with K-12 licensure
- o Doctor of Philosophy in Education – Educational Leadership Emphasis

Higher Education

- o Master of Science in Education – Higher Education
 - o Student Affairs Administration
 - o General Administration
 - o International Higher Education Leadership
- o Education Specialist
- o Doctor of Philosophy in Education – Higher Education Emphasis

Doctor of Philosophy – Community College Leadership

110 Education Building
757-683-4344

Ted Raspiller, Graduate Program Director

In order to meet the executive leadership workforce needs of the nation's community colleges, Old Dominion University has developed a Doctor of Philosophy degree in Community College Leadership. The innovative quality of this program supports the University's commitment to technology-delivered learning by implementing leadership graduate courses at each of the 23 VCCS community colleges and elsewhere in the United States through a variety of distance learning modalities including video conferencing, video streaming, asynchronous courses and other emerging technological approaches as they are available and practical. This enables prospective students to meet their personal and professional needs by offering accessible graduate education.

Some of the unique community college leadership issues that are addressed in this program are: the diversity of the student body, the role of the community college in the higher education system of Virginia, the role and expectations of the communities hosting the community college, and the importance of workforce preparation provided by Community Colleges.

Admission. Criteria for admission to the Ph.D. in Community College Leadership are as follows:

1. A completed master's degree in an appropriate discipline from an accredited university. Degrees that are equivalent to a master's degree such as L.L.B., J.D., and D.D.S. are also acceptable;
2. A minimum GPA of 3.5 (on a 4.0 scale) overall for the master's degree and in the major area of study in the master's degree;
3. A minimum of 1000 overall total score on the GRE with a minimum of 500 on both the verbal and quantitative sections of the GRE. Prospective students must score a minimum of 4.5 on the analytical writing portion of the GRE. GRE scores expire after five years; however, candidates who have completed the exam prior to five years before the application deadline may submit those scores for consideration if the scores meet the minimum expectations and they are provided from an official source such as a transcript or form provided by the Educational Testing Service. Old Dominion University reserves the right to determine what is an "official source." These scores are minimums; other portions of the total application package will be considered for admission;
4. Applicants whose native language is not English must submit a current score for the Test of English as a Foreign Language (TOEFL) of at least 600;
5. Applicants must submit a 1500 word statement of their academic and professional goals with an emphasis on how the Ph.D. degree in community college leadership will contribute to the achievement of the stated goals;
6. Three letters of reference from sources capable of commenting on the applicant's readiness for advanced graduate study are required. At least one of these letters must be from a senior-level administrator in a community college;
7. An interview with the Community College Leadership Program Admissions Committee may be required.

Prior course work is assumed in statistics, student development, workforce development, and leadership theory. If this assumption is not met, then additional course work may be added to the candidate's graduate program of study. Please see prerequisites and additions at the bottom of the curriculum description for specifics.

Continuance Requirements. At the end of each semester – fall, spring, and summer – the graduate program director reviews records of students who do not maintain a 3.00 cumulative grade point average (GPA). Graduate students, whether degree or non-degree seeking, who do not have a cumulative GPA of at least 3.00 will be placed on probation.

The Ph.D. program in community college leadership is comprised of courses totaling a minimum of 48 academic credit hours beyond the master's degree. The curriculum includes four parts: a content concentration totaling 18 credit hours, a research component including 12 credit hours, nine credit hours of electives, and the dissertation which will include a minimum of nine credit hours depending on the length of time necessary for completion.

Students entering the program may also need to complete one introductory statistics course if they have not had such a course or cannot demonstrate competency at a satisfactory level. Entering students who have not served in an administrative or other leadership position in a community college for a minimum of three years, they will need to complete two three credit hour internships (CCL 868) as part of their elective requirements. Students who come into the Ph.D. program with a master's degree in an academic field that is unrelated to higher education administration and/or who have not completed courses to develop competency in specified areas may need to complete these courses in lieu of electives.

Under normal circumstances, admissions will be offered once a year in order to build efficient cohort groups for this type of advanced study. In order to enhance the experience of the students and to increase the efficiency by which courses are offered, a cohort of 15 students will be admitted each year.

To build a cohesive cohort group, a series of intensive courses will be offered on the Old Dominion University campus each summer. Attendance is required for all newly admitted students. Residency at a second intensive seminar the following summer is expected but not required.

A minimum of two semesters of full-time study is required of students in the program to meet University residency requirements. One of the semesters of full-time study (defined as completion of nine credit hours) must be accomplished via the completion of the first intensive seminar noted above. The second semester of residency can be accomplished in several ways. Students may complete nine credit hours during a fall, spring or summer semester. Courses taken via TELETECHNET or other distance education methodologies are considered "resident" courses, so that taking three TELETECHNET courses during a semester may complete the second residency requirement.

Applicants must submit completed applications and all related material no later than February 1 of each year, and students will be admitted for study beginning in May of the same year.

Program Completion and Exit. In order to complete the program students must fully comply with the following curriculum.

Prerequisites

ELS 732	Statistics Applied to Research in Educational Leadership	3
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1. Community College Core (Minimum 18 credits)

The following nine courses (18 credits) are required for all students who did not have them as part of a master's degree program. If some or all of these courses were taken as part the student's master's program, the student may select alternate courses from the Electives List in consultation with the GPD.

CCL 820	Community College Leadership	3
CCL 824	Community College Finance	3
CCL 826	Community College Curriculum and Program Development	3
CCL 830	Community College Politics and Policy Development	3
CCL 866	The Modern Community College	3
OTED 865	Trends & Issues in Workforce and Economic Development	3
OTED 889	Instructional Technology in Education and Training	3

2. Research and Statistics (Minimum of 9 credits)

HIED 877	Advanced Program Assessment and Evaluation	3
ELS 832	Statistics Applied to Research in Education	3
ELS 833	Advanced Research Design and Analysis Rubric	3
ECL 890	Qualitative Research Design	3

3. Electives (Minimum 6 Credits)

COUN 807	Student & Adult Development	3
COUN 810	Intro to Student Personnel	3
HIED 808	Contemporary Issues in Higher Education	3
HIED 811	Higher Education and Society	3
HIED 812	Strategic Planning and Institutional Effectiveness	3
HIED 837	Academic Issues in Higher Education	3
HIED 845	Today's College Student and Diversity	3
HIED 852	The Law of Higher Education	3
HIED 856	Higher Education Finance	3
HIED 862	Development and Fund Raising	3
HIED 864	The College and University Presidency	3
HIED 865	Adult and Continuing Education	3
HIED 893	History of Higher Education in the U. S.	3
HIED 894	Organization & Administration of Higher Education	3
HIED 895	Topics in Higher Education Administration	3
OTED 861	Foundations of Adult Education and Training	3
OTED 862	Administration of Adult Training Programs	3
OTED 885	Curriculum Development in Occupational Education and Training	3
OTED 888	Instructional Strategies and Innovations in Training and Occupational Education	3
OTED 889	Instructional Technology in Education and Training	3

4. Dissertation Seminar (3 credits)

CCL 881	Dissertation Seminar	3
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5. Dissertation (Minimum 9 credits)

CCL 899	Dissertation	9 (min)
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6. Experiential Requirements.

One 3 credit hour internship is required for all doctoral students. Two internships are required of students who have not completed a minimum of three years of administrative experience in a Community College. It is expected that each intern will work with an administrator at the dean level or higher).

CCL 868	Internship in Community College Leadership	3
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Educational Leadership

120 Education Building
757-683-3326

http://education.odu.edu/elc/academics/educational/ed_leadership_phd.shtml

William Owings, Graduate Program Director

The purpose of the graduate programs in educational leadership is to prepare individuals to assume leadership responsibilities in education, training, and human service organizations. Educational leadership offers the M.S.Ed. degree

for candidates seeking principal and supervision licensure, the Ed.S. degree (with and without initial licensure) and the Ph.D. in educational leadership. The programs emphasize the preparation of visionary and responsive leaders for educational and training organizations. The program fosters an opportunity to obtain an understanding of the knowledge, research, skills, practices, and attitudes via study and field experiences. The emphasis area in educational administration and supervision is approved by the state of Virginia and the National Council for Accreditation of Teacher Education. Individualized programs are also planned.

The administration and supervision emphasis area is based on the standards of the National Council for Accreditation of Teacher Education and approved by the Commonwealth of Virginia. Through this program participants will develop and demonstrate competence in the following areas.

1. Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by facilitating the development, articulation, implementation, and stewardship of a school or district vision of learning supported by the school community.
2. Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by promoting a positive school culture, providing an effective instructional program, applying best practice to student learning, and designing comprehensive professional growth plans for staff.
3. Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by managing the organization, operations, and resources in a way that promotes a safe, efficient, and effective learning environment.
4. Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by collaborating with families and other community members, responding to diverse community interests and needs, and mobilizing community resources.
5. Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by acting with integrity, fairly, and in an ethical manner.
6. Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by understanding, responding to, and influencing the larger political, social, economic, legal, and cultural context.
7. Internship. The internship provides significant opportunities for candidates to synthesize and apply the knowledge and practice and develop the skills identified in Standards 1-6 through substantial, sustained, standards-based work in real settings, planned and guided cooperatively by the institution and school district personnel for graduate credit.

Master of Science in Education - Administration and Supervision emphasis

120 Education Building
757-683-3326

http://education.odu.edu/elc/academics/educational/ed_leadership_phd.shtml

William Owings, Graduate Program Director

Admission. To gain admission, applicants must:

1. meet all University admissions requirements;
2. have an undergraduate grade point average of 2.80 overall and 3.00 in the major;
3. provide two letters of recommendation, including one from an administrator who will serve as the student's sponsor/mentor;
4. complete a one-page essay explaining why he/she should be admitted into the program; and,
5. obtain an acceptable score on the Graduate Record Examination or the Miller Analogies Test.

In addition, all students who wish to enter the administration and supervision program with Commonwealth of Virginia accreditation must satisfactorily complete an administrative skills portfolio assessment process. ELS 600 must be the first course in which students enroll. Performance in classes as a non-degree student will not be taken into consideration in the admission process.

Continuance. Students must meet all University and program requirements including the administrative skills portfolio and maintain a 3.00 graduate average. Those seeking the Administration and Supervision PreK-12 endorsement on their Commonwealth of Virginia Postgraduate Professional license beginning July 1, 2005 must take and pass the School Leaders Licensure Assessment (SLLA, #1010).

Exit. Students must successfully complete:

1. the School Leaders Licensure Assessment (SLLA);
2. the required course of study;
3. a critical issues paper in ELS 673;
4. the administrative skills assessment portfolio, observation and practicum, and internship; and,
5. have a minimum 3.00 grade point average in order to graduate.

Program Requirements

For the Master of Science in Education with an emphasis in administration and supervision, a student must have completed an approved 36-hour minimum graduate program with a culminating written comprehensive examination and administrative skills portfolio assessment. Approved field observation, practicum, and internship experiences are required, and students must demonstrate competence in computer applications in educational administration and supervision or take ELS 760. The thesis option is available to all students.

Administration and Supervision Preparation for Public School Pre K-12 Licensure

Requirements for this emphasis area are as follows.

1. Prerequisite. Demonstrated competency in computer applications.

2. Curriculum. (21 credits)

ELS 600	Principal Orientation and Instructional Leadership	3
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This course must be taken first and includes the start of an Administrative Portfolio Skills Assessment.

ELS 610	School Community Relations and Politics	3
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ELS 621	Curriculum Development and Assessment	3
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ELS 753	Public School Finance	3
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ELS 754	Human Resource Development and Evaluation	3
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ELS 787	Pupil Personnel Services for Diverse Populations	3
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ELS 657	Public School Law	3
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3. Clinical Experiences: (9 credits)

ELS 626	Instructional Supervision and Assessment	3
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ELS 668	Internship I	3
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ELS 669	Internship II	3
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4. Research Component: (6 credits)

ELS 732	Statistics Applied to Research in Human Services	3
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ELS 673	Critical Issues Research	3
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Licensure-Only (Non-Degree Student)

http://education.odu.edu/elc/academics/educational/ed_leadership_phd.shtml

William Owings, Graduate Program Director

All licensure-only students must have a bachelor's and master's degree from an accredited university, three years of educational experience, and completion of the state-approved licensure-only course work to obtain PreK-12 administration and supervision licensure. The graduate program director in educational leadership must receive licensure-only students' official transcripts and proof of three years of educational experience prior to the end of the first semester of course work. A non-degree status student awaiting admission to a degree program should submit materials directly to the Office of Admissions. Only 12 hours of course work can be transferred from non-degree status. Students must successfully complete the School Leaders Licensure Assessment (SLLA).

Education Specialist–Educational Leadership

110 Education Building
757-683-3326

http://education.odu.edu/elc/academics/educational/ed_leadership_phd.shtml

William Owings, Graduate Program Director

The Education Specialist (Ed.S.) program is designed to provide further opportunities for holders of master's degrees to develop expertise at a higher professional level. Emphasis is on continued development for leadership in policy formulation, planning, and executive action related to educational and training institutions and human service organizations. Individuals who aspire

to advance in educational leadership will find in this program a meaningful base for building toward their professional objectives. The Ed.S. program in educational leadership includes emphasis areas in administration and supervision and in higher education.

Admission. Students must:

1. meet all University requirements;
2. provide two letters of recommendation;
3. hold a master's degree from an accredited institution (minimum 3.25 graduate grade point average on a 4.00 scale);
4. provide a one-page essay explaining why he/she should be admitted into the program; and,
5. have an acceptable score on the general aptitude section of the Graduate Record Examination or the Miller Analogies Test. Applicants whose admission credentials are slightly below the required minimum will be considered for provisional admission. Performance in classes as a non-degree student will not be taken into consideration in the admission process.

Continuance. Students must meet all University requirements and maintain a 3.00 or higher grade point average.

Exit. Students must successfully complete:

1. a written comprehensive examination;
2. the required course of study; and,
3. have a 3.00 grade point average or above.

Education Specialist Program Requirements

The Ed.S. requires the completion of a minimum of 30 approved semester credit hours consisting of at least 18 hours at the 800 level.

Course Requirements: (18 credits)

ELS 853	Public School Finance	3
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ELS 854	Human Resource Development and Evaluation	3
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ELS 871	Educational Systems, Planning and Futures	3
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ELS 876	Leadership in Social Justice	3
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ELS 878	Leadership for Teaching and Learning	3
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ELS 879	Field Research in School Administration and Supervision	3
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Elective Courses: (Select 4, total 12 credits)

ELS 855	Political Systems, Legislation and Urban Education	3
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ELS 864	History and Philosophy of American Public School Reform	3
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ELS 880	Seminar in Curriculum Leadership	3
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ELS 883	Contemporary Issues in Urban Educational Leadership	3
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Education Specialist with Licensure Program

http://education.odu.edu/elc/academics/educational/ed_leadership_phd.shtml

William Owings, Graduate Program Director

Under special conditions, exceptional students may be accepted into the Ed.S. program who have a master's degree in another area and do not have a license in administration supervision PreK-12. These students would complete the following 39 semester hours of coursework to lead to licensure as an administrator. The classes marked with an asterisk are required classes for licensure.

Course Requirements: (30 credit hours)

ELS 600	Principal Orientation and Instructional Leadership Seminar*
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ELS 610	School Community Relations and Politics*
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ELS 621	Curriculum Development and Assessment*
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ELS 626	Instructional Supervision, Staff Development, and Assessment
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ELS 657	Public School Law*
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ELS 668	Internship I*
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ELS 669	Internship II*
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ELS 787	Pupil Personnel Services for Diverse Populations*
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ELS 853	Public School Finance*
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ELS 854	Human Resource Development and Evaluation*
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Elective Courses: (9 credit hours selected from below; other doctoral-level classes may be taken in consultation with your advisor)

ELS 811	Leadership Theory for School Improvement
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ELS 835	Organizational Behavior in Education
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ELS 871	Educational Systems, Planning, and Futures
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ELS 876	Leadership in Social Justice
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ELS 878 Leadership for Teaching and Learning
 ELS 879 Field Research in School Administration and Supervision

* Denotes licensure requirement courses.

Students must successfully complete the School Leaders Licensure Assessment (SLLA).

Doctor of Philosophy in Education– Educational Leadership Emphasis

William Owings, Graduate Program Director

http://education.odu.edu/elc/academics/educational/ed_leadership_phd.shtml

Program Requirements

Prerequisites:

ELS 660, COUN 635, or ECI 635 (or equivalent)
 ELS 732 Statistics Applied to Educational Research 1 (or equivalent)

Research Core: (15 hours)

ELS 831	Accountability in Educational Leadership	3
ELS 832	Statistics Applied to Educational Research	3
ELS 833	Advanced Research Design and Analysis	3
ECI 890	Qualitative Research Design	3
ECI 891	Program Evaluation in Education	3

Educational Leadership and Services Concentration Courses: (21 hours)

ELS 811	Leadership Theory for Educational Improvement	3
ELS 815	Leadership for Equity and Inclusive Education	3
ELS 821	Policy and Politics in Educational Leadership	3
ELS 835	Organizational Theory and Behavior in Education	3
ELS 875	Moral and Ethical Dimensions of Leadership	3
ELS 876	Leadership in Social Justice	3
ELS 878	Leadership for Teaching and Learning	3

Electives: (9 hours)*

ELS 864	History and Philosophy of American Public School Reform	3
ELS 871	Educational Systems, Planning, and Futures	3
ELS 874	Advanced School Law, Finance, and Operations	3
ELS 880	Multicultural Curriculum Leadership and Globalization	3
ELS 883	Contemporary Issues in Education	3

*With advisor approval, two of these courses may be substituted with courses outside of the educational leadership program to allow students to form cognate areas.

Capstone Course: (3 hours)

ELS 881	Dissertation Seminar	3
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Dissertation: (Minimum of 12 hours)

ELS 899	Dissertation	3-15
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Continuance Requirements. At the end of each semester – fall, spring, and summer – the graduate program director reviews records of students who do not maintain a 3.00 cumulative grade point average (GPA). Graduate students, whether degree or non-degree seeking, who do not have a cumulative GPA of at least 3.00 will be placed on probation. In addition, students must be continuously enrolled in the cohort.

Program Requirements

The Ph.D. program in educational leadership consists of a minimum of 48 academic credit hours beyond the master's degree and a minimum of 12 credits for the dissertation. The curriculum includes four parts: an introductory course (3 credits), elective (3 credits), the research core (15 credits), the ELS concentration specific courses (24 hours), and the capstone course (3 credits). The dissertation will include a minimum of 12 credit hours. Students entering the program may also need to complete one or more introductory statistics course if they have not had such a course or cannot demonstrate competency at a satisfactory level. Students who come into the Ph.D. program with a master's degree in an academic field that is unrelated to educational leadership and/or

who have not completed courses to develop competency in specified areas may need to complete other courses in lieu of electives.

Admission is on a rolling basis. Students can commence their programs of study during the semester immediately following admission.

Program Completion and Exit. In order to complete the program students must fully comply with the curriculum below and achieve a GPA of 3.00 or higher.

Educational Leadership Curriculum - 48 credits

Prerequisites:

ELS 660, COUN 635, or ECI 635 (or equivalent)
 ELS 732 Statistics Applied to Educational Research 1 (or equivalent)

Research Core: (15 hours)

ELS 831	Accountability in Educational Leadership	3
ELS 832	Statistics Applied to Educational Research 2	3
ELS 833	Advanced Research Design and Analysis	3
ECI 890	Qualitative Research Design	3
ECI 891	Program Evaluation in Education	3

Educational Leadership and Services Concentration Courses: (21 hours)

ELS 811	Leadership Theory for Educational Improvement	3
ELS 815	Leadership for Equity and Inclusive Education	3
ELS 821	Policy and Politics in Educational Leadership	3
ELS 835	Organizational Theory and Behavior in Education	3
ELS 875	Moral and Ethical Dimensions of Leadership	3
ELS 876	Leadership for Social Justice	3
ELS 878	Leadership for Teaching and Learning	3

Electives: (9 hours)*

ELS 864	History and Philosophy of American Public School Reform	3
ELS 871	Educational Systems, Planning, and Futures	3
ELS 874	Advanced School Law, Finance, and Operations	3
ELS 880	Multicultural Curriculum Leadership and Globalization	3
ELS 883	Contemporary Issues in Education	3

*With advisor approval, two of these courses may be substituted with courses outside of the educational leadership program to allow students to form cognate areas.

Capstone Course: (3 hours)

ELS 881	Dissertation Seminar	3
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Dissertation: (Minimum of 12 hours)

ELS 899	Dissertation	12 minimum
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Higher Education

The department offers, emphasis areas in higher education in the M.S.Ed. and Ed.S. degrees as well as the Ph.D. in higher education.

Master of Science in Education - Higher Education Emphasis

120 Education Building
 757-683-3326

Dana D. Burnett, Graduate Program Director

The purpose of the master's degree program is to prepare individuals to assume professional administrative positions in institutions of postsecondary education. The program is focused upon student affairs, international, and other higher education areas. The program features a mix of theory and practice and offers students the opportunity to gain expertise in both administrative and counseling skills. The program is among those listed as meeting the requirements for graduate programs of the American College Personnel Association (ACPA) and is also listed among programs endorsed by the National Association of Student Personnel Administrators (NASPA). The program meets standards established by the Council for the Advancement of Standards in Higher Education (CAS).

Admission, Continuance, and Exit Requirements

Admission. Prospective students seeking admission to the master's degree program in higher education must:

1.	meet all University admission requirements as listed in the Old Dominion University Catalog;	HIED 756	Higher Education Finance	3
2.	have earned an undergraduate grade point average of 2.80 overall and 3.00 in the major;	HIED 757	The Multicultural University	3
3.	provide two letters of recommendation from an administrator or faculty member at the student's undergraduate institution (one letter should come from a person who has supervised the student in a student leadership position or who can comment on the student's potential for work in a higher education setting, the other may come from another person);	HIED 761	Higher Education Capstone	3
4.	provide a one page essay describing goals to be achieved as a result of completion of a master's degree in higher education; and	HIED 793	The History of Higher Education	3
5.	have an acceptable score on the Graduate Record Examination (GRE) or Miller Analogies Test (MAT) for admission.	HIED 794	Organization and Administration of Higher Education	3
Continuance. Regularly accepted students and those who become "regular" students must:				
1.	meet all University and program requirements;			
2.	maintain a 3.00 grade point average; and			
3.	complete internship requirements in a timely manner.			
Exit. In order to graduate from the program, students must successfully complete:				
1.	the required course of study for a total of at least 42 credit hours of coursework*;			
2.	a written comprehensive examination.			
Program Requirements - In order to complete the course of study for the degree of Master of in Higher Education, a student must fulfill the requirements noted above. This course of study includes satisfactory completion of 27 hours of required courses, nine hours of cognate courses and six hours of internship credit*.				
Curriculum - Higher Education - Student Affairs Administration				
Required Courses - 27 credits				
COUN 635	Research Methods and Program Evaluation			
	in Counseling	3		
COUN 707	College Student and Adult Development Theory	3		
HIED 708	Contemporary Issues in Higher Education	3		
HIED 710	Introduction to Student Affairs Administration	3		
HIED 733	Professional Helping Skills in Higher Education	3		
HIED 745	Today's College Student and Diversity	3		
HIED 752	The Law of Higher Education	3		
HIED 757	The Multicultural University	3		
HIED 761	Higher Education Capstone	3		
Cognate Courses - 9 credits				
COUN 648	Foundations of Career Development	3		
COUN 655	Social and Cultural Issues in Counseling	3		
ELS 732	Statistics Applied to Research in Education			
	and Human Services I	3		
HIED 720	The Private College and University	3		
HIED 743	Introduction to International Higher			
	Education Administration	3		
HIED 744	Comparative Higher Education Systems	3		
HIED 756	Higher Education Finance	3		
HIED 757	The Multicultural University	3		
HIED 758	Higher Education Leadership	3		
HIED 759	Higher Education Curriculum	3		
HIED 762	Development and Fund-Raising	3		
HIED 764	The College and University Presidency	3		
HIED 766	The Contemporary Community College	3		
HIED 777	Advanced Program Assessment and Evaluation	3		
HIED 793	History of Higher Education in the U.S.	3		
HIED 794	Organization and Administration of Higher			
	Education	3		
HIED 795	Special Topics in Higher Education	3		
CCL 820	Community College Leadership	3		
CCL 824	Community College Finance	3		
CCL 826	Community College Curriculum	3		
Internships -6 credits				
HIED 668	Internship One	3		
HIED 668	Internship Two	3		
Higher Education - General Administration				
Required Courses - 27 credits				
COUN 635	Research Methods and Program			
	Evaluation in Counseling	3		
HIED 708	Contemporary Issues in Higher Education	3		
HIED 710	Introduction to Student Affairs Administration	3		
HIED 733	Professional Helping Skills in Higher Education	3		
HIED 752	The Law of Higher Education	3		
HIED 756	Higher Education Finance	3		
HIED 757	The Multicultural University	3		
HIED 758	Higher Education Leadership	3		
HIED 759	Higher Education Curriculum	3		
HIED 762	Development and Fund-Raising	3		
HIED 764	The College and University Presidency	3		
HIED 766	The Contemporary Community College	3		
HIED 777	Advanced Program Assessment and Evaluation	3		
HIED 793	History of Higher Education in the U.S.	3		
HIED 794	Organization and Administration of Higher			
	Education	3		
HIED 795	Special Topics in Higher Education	3		
CCL 820	Community College Leadership	3		
CCL 824	Community College Finance	3		
CCL 826	Community College Curriculum	3		
Internships -6 credits				
HIED 668	Internship One	3		
HIED 668	Internship Two	3		
Higher Education - International Higher Education Leadership				
Required Courses - 27 credits				
COMM 600	Intercultural Communication or	3		
ENGL 677	Language and Communication Across Cultures	3		
COUN 635	Research Methods and Program Evaluation			
	in Counseling	3		
COUN 707	Adult and College Student Development	3		
HIED 708	Contemporary Issues in Higher Education	3		
HIED 743	Introduction to International Higher			
	Education Administration	3		
HIED 744	Comparative Higher Education Systems	3		
HIED 752	The Law of Higher Education	3		
HIED 757	The Multicultural University	3		
HIED 761	Higher Education Capstone	3		
Cognate Courses - 9 - Choose three courses:				
HIED 733	Professional Helping Skills in Higher Education	3		
HIED 745	The Contemporary College Student	3		
HIED 756	Higher Education Curriculum	3		
HIED 758	Leadership in Higher Education	3		
HIED 759	Higher Education Curriculum	3		
HIED 777	Advanced Program Assessment and Evaluation	3		
HIED 793	History of Higher Education in the U.S.	3		
COUN 633	Counseling and Psychotherapy Techniques	3		
COUN 655	Social and Cultural Issues in Counseling	3		
ELS 732	Statistics in Education and Human Services I	3		
HIST 633	Studies in International History	3		
PSYC 653	Personality Psychology	3		
IS 705	The Euro-Atlantic Community	3		
IS 713	Global Political Economy	3		
IS 741	Globalization and Social Change in the World Systems	3		
ECON 650	International Economics	3		
MKTG 640	Global Marketing Management	3		
Education Specialist – Emphasis in Higher Education				
Dana Burnett, Program Director				
The Education Specialist program is designed to provide further opportunities for holders of master's degrees to develop expertise at a higher professional level. Emphasis is on continued development for leadership in policy formulation, planning, and executive action related to educational and training institutions and human service organizations. Individuals who aspire				

to advance in higher education administration will find in this program a meaningful base for building toward their professional objectives.

Admission, Continuance, and Exit Requirements

Admission. Students must (1) meet all University requirements; (2) provide two letters of recommendation; (3) hold a master’s degree from an accredited institution (minimum 3.25 graduate grade point average on a 4.00 scale); (4) provide a 1500 word essay explaining why he/she should be admitted into the program; and (5) have an acceptable score on the general aptitude section of the Graduate Record Examination or the Miller Analogies Test. Applicants whose admission credentials are slightly below the required minimum will be considered for provisional admission. Performance in classes as a non-degree student will not be taken into consideration in the admission process.

Continuance. Students must meet all University requirements and maintain a 3.00 or higher grade point average.

Exit. Students must successfully complete (1) a written comprehensive examination; (2) the required course of study; and (3) have a 3.00 grade point average or above.

Program Requirements

The Education Specialist in higher education requires the completion of a minimum of 30 approved semester credit hours beyond the master’s degree. Because of the wide variation of backgrounds among students seeking this degree, the curricular requirements will be determined based upon the applicant’s background *Required courses, if they have not been taken at the 700 level within a master’s degree program include COUNS 807, HIED 808, HIED 852, and HIED 894.

Education Specialist in Higher Education

Higher Education Core - 18 credits

Students will choose, with the assistance of their advisor, six courses from the following, which do not repeat courses taken for the master’s degree

HIED 808	Contemporary Issues in Higher Education	3
HIED 810	Introduction to Student Affairs Administration	3
HIED 820	The Private College and University	3
HIED 833	Professional Helping Skills in Higher Education	3
HIED 843	Introduction to International Higher Education Administration	3
HIED 844	Comparative Higher Education Systems	3
HIED 845	Contemporary College Student	3
HIED 852	The Law of Higher Education	3
HIED 856	Higher Education Finance	3
HIED 857	The Multicultural University	3
HIED 858	Leadership in Higher Education	3
HIED 859	Higher Education Curriculum	3
HIED 861	Higher Education Capstone	3
HIED 864	The College and University Presidency	3
HIED 866	The Modern Community College	3
HIED 893	History of Higher Education in the U.S.	3
HIED 894	Organization and Administration of Higher Education	3
HIED 895	Special Topics in Higher Education	3
CCL 820	Community College Leadership	3
CCL 824	Community College Finance	3
CCL 826	Community College Curriculum	3

Research Courses - 9 credits

ELS 732	Statistics Applied to Research in Education and Human Services I	3
HIED 877	Advanced Program Assessment and Evaluation	3
ELS 833	Research Design	3

Internship - 3 credits

HIED868	Internship	3
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Doctor of Philosophy in Education - Higher Education Emphasis

Dana Burnett, Program Director

The Doctor of Philosophy is the degree most often desired for those who aspire to senior administrative roles in institutions of higher education. Possession of this degree also provides those who have earned it with entry into business, government, research and other leadership positions. The Ph.D. in

higher education is intended to prepare individuals for administrative and faculty positions; and to provide these students with the skills to carry out scholarly research, lead organizations, and create new knowledge. The curriculum described below contains elements that will, if completed successfully, provide research expertise, administrative skills and experience, and the ability to serve the nation’s colleges and universities and contribute to higher education elsewhere in the world.

Admission, Continuance, and Exit Requirements

Admission. Criteria for admission to the Ph.D. in higher education are as follows:

1. A completed master’s degree in an appropriate discipline from a regionally accredited university. Degrees that are equivalent to a master’s degree such as L.L.B., J.D., and D.D.S. are also acceptable;
2. A preferred minimum GPA of 3.5 (on a 4.0 scale) overall for the master’s degree and in the major area of study in the master’s degree;
3. A minimum of 1000 overall total score on the GRE and a preferred score of 500 or above on both the verbal and quantitative sections of the GRE. Prospective students must score a minimum of 4.5 on the analytical writing portion of the GRE. GRE scores expire after five years; however, candidates who have completed the exam prior to five years before the application deadline may submit those scores for consideration if the scores meet the minimum expectations and they are provided from an official source such as a transcript or form provided by the Educational Testing Service. Old Dominion University reserves the right to determine what an “official source” is. While these scores are minimums, other portions of the total application package will be strongly considered to balance lower scores;
4. Applicants whose native language is not English must submit a current score for the Test of English as a Foreign Language (TOEFL) of at least 600;
5. Applicants must submit a 1500 word statement of their academic and professional goals with an emphasis on how the Ph.D. degree in higher education will contribute to the achievement of the stated goals;
6. Three letters of reference from sources capable of commenting on the applicant’s readiness for advanced graduate study. At least one of these letters must be from a senior-level administrator in a college or university;
7. An interview with the Higher Education Program Committee. This committee will also review applications for admission; and,

Prior course work is assumed in statistics, student development, and leadership theory. If this assumption is not met, then additional course work will be added to the candidate’s graduate program of study. Please see prerequisites and additions at the bottom of the curriculum description for specifics.

Continuance. Students must meet all University requirements and maintain a 3.00 or higher grade point average. Students must be continuously enrolled in at least two courses each semester until all courses prior to the dissertation are completed. After completion of all such coursework, students must be enrolled in either a dissertation credit course or Higher Education 999 until graduation. Please see the Ph.D. in Education Handbook for more details.

Program Requirements. The Ph.D. program in higher education consists of courses totaling a minimum of 60 academic credit hours beyond the master’s degree. The curriculum includes four parts: a content concentration totaling 33 credit hours (including the higher education core – 21 credits and a cognate – 12 credits, a research component including 12 credit hours, and the dissertation seminar for three hours and the dissertation which will include a minimum of 12 credit hours. The dissertation will often include more than 12 credit hours depending on the length of time necessary for completion. Students entering the program may also need to complete one introductory statistics course and one research methods course if they have not had such courses or cannot demonstrate competency at a satisfactory level. If students have not yet served in an administrative or other leadership position in a college or university for a minimum of three years, completion of six credit hours of internship (HIED 868) is required. Students who come into the Ph.D. program with a master’s degree in an academic field that is unrelated to higher education administration and/or who have not completed courses to develop competency in specified areas may need to complete these courses in lieu of electives.

Under normal circumstances, admissions will be offered once a year in order to build efficient cohort groups for this type of advanced study. In order to enhance the experience of the students and to increase the efficiency by which courses are offered, a cohort of 5-10 students will be admitted each year. This limited number of students is necessary to assure that there is an adequate number of full-time faculty members to serve the students through advising and

other duties, particularly when the cohorts reach the dissertation stage of the program.

To build a cohesive cohort group, a series of intensive courses will be offered on the Old Dominion University campus each summer. It will be expected that all newly admitted students will come to campus for one of these seminars during the summer after they are admitted to the program and complete two courses together as a group. These courses will be selected from within the “content concentration” or “research” requirements. A third course will be available for regular study during the summer so that students may comply with one of the residency requirements. Residency at a second intensive seminar the following summer is recommended but not required.

A minimum of two semesters of full-time study is required of students in the program to meet University residency requirements. One of the semesters of full-time study (defined as completion of nine credit hours) must be accomplished by the completion of the intensive seminar noted above. The second semester of residency can be accomplished in several ways. Students may complete nine credit hours during Fall or Spring or three hours in the summer or may attend a second summer residency. Courses taken via TELETECHNET or other distance education methodologies are considered “resident” courses, so that taking three TELETECHNET courses during a semester may complete the second residency requirement.

Applicants must submit completed applications and all related material no later than February 1 of each year, and students will be admitted for study beginning in June or July of the same year.

Exit. In order to complete the program students must fully comply with the curriculum below and with all requirements noted elsewhere in the University catalog for graduate students and with requirements listed in the Ph.D. in Education Handbook. It is the responsibility of the student to obtain these materials and comply with required portions.

Curriculum

Prerequisites - (6 credits)

COUN 635	Research Methods and Program Evaluation in Counseling (or equivalent)	3
ELS 732	Statistics Applied to Research in Education and Human Services I (or equivalent)	3

Content Concentration (33 credits)

1. Higher Education Core (Minimum 21 credits)

The following seven courses (21 credits) are required for all students who did not have them as part of a master’s degree program. If some or all of these courses were taken as part the student’s master’s program, they and his or her advisor may choose alternate courses from those listed below.

HIED 808	Contemporary Issues in Higher Education	3
HIED 852	The Law of Higher Education	3
HIED 856	Higher Education Finance	3
HIED 857	The Multicultural University	3
HIED 893	History of Higher Education in the U. S.	3
HIED 894	Organization and Administration of Higher	

	Education	3
COUN 807	Adult and Student Development Theory	3

2. Cognate (minimum of 12 credits from one of these areas)*

2a. Higher Education Policy and Administration

HIED 808	Contemporary Issues in Higher Education	3
HIED 820	The Private College and University	3
HIED 858	Higher Education Leadership	3
HIED 859	Higher Education Curriculum	3
HIED 862	Development and Fund-Raising	3
HIED 864	The College and University Presidency	3

2b. Student Affairs

HIED 810	Introduction to Student Affairs Administration	3
HIED 830	Seminar in Student Affairs Administration	3
HIED 831	Group Dynamics in Higher Education	
HIED 833	Professional Helping Skills in Higher Education	3
HIED 845	The Contemporary College Student	3

2c. Community Colleges

HIED 866	The Contemporary Community College	3
CCL 820	Community College Leadership	3
CCL 824	Community College Finance	3
CCL 826	Community College Curriculum and Program Development	3

* The graduate program director may allow other cognate areas to be developed and implemented by students and advisors upon request if a particular justification is made in writing.

3. Research and Statistics (12 credits)*

ELS 832	Statistics Applied to Research in Education and Human Services II	3
ELS 833	Advanced Research Design and Analysis	3
ECI 890	Qualitative Research Design	3
HIED 877	Advanced Program Evaluation and Assessment	3

* Some courses may be waived based on previous study.

4. Dissertation Seminar - (3 credits)

HIED 881	Dissertation Seminar	3
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5. Dissertation (Minimum 12 credits)

HIED 899	Dissertation	12 (min)
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Additions

HIED 868 Internship in Higher Education Administration (6 credits) is required for all doctoral students who have not served in a full-time administrative position for at least three years prior to admission. Those students interested in community colleges may substitute CCL 868 – Internship in Community College Administration. It is expected that each intern will work with an administrator at the dean level or higher.

Special Courses

These courses may be used for a variety of specialized topical seminars and may fill requirements in one or more of the cognate areas noted above.

HIED 895	Special Topics in Higher Education	3
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Department of Human Movement Sciences

2007 Student Recreation Center
757 683-4995, 757 683-4270

Bob Spina, Chair

The Department of Human Movement Sciences offers programs leading to the Master of Science in Education with a concentration in physical education, and the Doctor of Philosophy in Education - Human Movement Science emphasis. The Master of Science in Education with a concentration in physical education includes emphasis areas in athletic training, athletic training with initial Virginia Licensure in physical education and health education, curriculum and instruction, curriculum and instruction with Initial Virginia Licensure in physical education and health education, exercise science and wellness, sport management, and recreation and tourism studies.

Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in the catalog. Students should obtain current program information from their advisors and the Darden College of Education website at <http://education.odu.edu/>.

Individual programs are described on the following pages:

Master of Science in Education Physical Education

- Athletic Training
- Athletic Training with Initial Licensure in Physical Education and Health Education
- Exercise Science and Wellness
- Curriculum and Instruction
- Curriculum and Instruction with Initial Licensure in Physical Education and Health Education
- Recreation/Tourism Studies
- Sport Management

Doctor of Philosophy in Education - Human Movement Science

Master of Science in Education – Physical Education

The department offers a varied graduate program that includes three separate tracks and seven emphasis areas. The three tracks are as follows: (1) thesis research (30 credit hours minimum, including a six-credit-hour thesis); (2) research problem (33 credit hours minimum, including a three-credit-hour research problem); (3) non-research (36 credit hours minimum). The sport management, recreation and tourism studies, exercise science and wellness, and curriculum and instruction emphasis areas contain a minimum of 36 credit hours to graduate. The athletic training emphasis area contains a minimum of 39 credit hours to graduate and the athletic training with initial Virginia Licensure in physical education and health education could contain up to 73 credit hours to graduate in order to fulfill both area requirements. The curriculum and instruction emphasis area includes a program for currently licensed teachers as well as a program that leads to initial PK-12 health/physical education teacher licensure in the Commonwealth of Virginia.

Athletic Training

2003A Student Recreation Center
757-683-3516

Bonnie L. Van Lunen, Graduate Program Director

This emphasis is designed to prepare athletic trainers for advanced study in the areas of research, clinical application, and education. The associated course work will involve exploration of biomechanical concepts, advanced clinical practice techniques, and preparation of the entry level educator.

Admission and Entrance Requirements. Students must have (1) a bachelor's degree from an accredited institution with a cumulative undergraduate GPA of 3.0 and a GPA of 3.00 in the undergraduate major courses; (2) the Board of Certification credential for certification as an Athletic

Trainer, OR eligibility to take the Board of Certification examination; and (3) a score of at least 900 between quantitative and verbal on the Graduate Record Examination (GRE) for admission to regular status. Students who have either a low GPA or a low GRE score may be considered for admission to provisional status. GRE scores are required for consideration of admittance. Acceptance into the graduate school does not imply automatic acceptance into the athletic training emphasis area. All applicants must complete separate application materials for the Office of Graduate Admissions and for the graduate athletic training education program. The graduate athletic training education program application materials can be found on the web page. The application deadline is February 1, however applications will be reviewed as soon as they are complete. Interviews are required and scheduled through invitation from the program director.

Continuance and Exit Requirements. Students must meet all requirements for continuance as outlined in the graduate continuance policy for the University. Students completing the program of study must (1) have an overall grade point average of 3.00; (2) have a GPA of 3.00 in the major; (3) demonstrate writing proficiency; (4) satisfy all course competencies; (5) pass a comprehensive examination; (6) complete a research project or thesis; (7) have an exit interview with the program director; and (8) file the necessary paperwork for graduation.

Curriculum. Requirements for the athletic training emphasis are as follows (39 credits):

Core courses - 20 credits

ESPR 628	The Spine: Evaluation and Rehabilitation	3
ESPR 647	Education in Athletic Training	4
ESPR 649	Clinical Methods in Athletic Training	3
ESPR 691	Gross Anatomy for Sports Medicine Clinicians	4
ESPR 711	Analysis of Human Motion	3
ESPR 725	Clinical Biomechanics for Rehabilitation Professionals	3

Research Core - 6 credits

ESPR 634	Statistics in Health, Physical Education, Recreation, and Sports	3
ESPR 635	Research Methods in Health, Physical Education, Recreation, and Sports	3

Requirements for different tracks are as follows:

Thesis Track - 13 credits

ESPR 698	Thesis	3
ESPR 699	Thesis	3
Electives		7

Research-Problem Track (13 credits)

ESPR 636	Research Problems in Health, Physical Education, Recreation, and Sports	3
Electives		10

Athletic Training with Initial Virginia Licensure in Physical Education and Health Education Emphasis

2003A Student Recreation Center
757-683-3516

Bonnie L. Van Lunen, Graduate Program Director

This emphasis is designed to prepare athletic trainers for advanced study in the areas of research, clinical application, and education. The associated course work will involve exploration of biomechanical concepts, advanced clinical practice techniques, and preparation of the educator for teaching licensure (PreK-12) within the state of Virginia for physical education and health education.

Admission and Entrance Requirements. Students applying for admission with regular status must have (1) a bachelor's degree from an accredited institution with a cumulative undergraduate GPA of 3.0 and a GPA of 3.00 in the undergraduate major courses; (2) the Board of Certification credential for certification as an Athletic Trainer, OR eligibility to take the Board of Certification examination; (3) a score of at least 900 between quantitative and verbal on the Graduate Record Examination (GRE) for admission to regular status; and (4) a composite score of 532 on the PRAXIS I (PPST in reading, writing, and mathematics) or State Board approved equivalent SAT or ACT for admission to the program and acceptance into teacher education. Students who have either a low GPA or a low GRE score may be considered for admission to provisional status. GRE scores are required for consideration of admittance. Acceptance into the graduate school does not imply automatic acceptance into

this emphasis area. All applicants must complete separate application materials for the Office of Graduate Admissions and for the graduate athletic training education program. The graduate athletic training education program application materials can be found on our web page. The application deadline is February 1st; however, applications will be reviewed as soon as they are complete. Interviews are required and scheduled through invitation from the program director.

Continuance and Exit Requirements. Students must meet all requirements for continuance as outlined in the graduate continuance policy for the University. Students completing the program of study must (1) have an overall grade point average of 3.00; (2) have a GPA of 3.00 in the major; (3) demonstrate writing proficiency; (4) satisfy all course competencies; (5) pass a comprehensive examination; (6) complete a research project or thesis; (7) have an exit interview with the program director; and (8) file the necessary paperwork for graduation and teacher licensure.

Curriculum. Requirements for the emphasis are as follows (73 credits):

Core courses - 25 credits

ESPR 601	Adapted Physical Education Design and Supervision	3
ESPR 606	Planning and Administration of an Effective HPE Program	3
ESPR 649	Clinical Methods in Athletic Training	3
ESPR 691	Gross Anatomy for Sports Medicine Clinicians	4
ESPR 711	Analysis of Human Motion	3
ESPR 720	Curriculum Development in Physical Education	3
ESPR 739	Current Research in Motor Development	3
ESPR 745	Assessment and Evaluation in Physical Education	3

Research Core - 6 credits

ESPR 634	Statistics in Health, Physical Education, Recreation, and Sports	3
ESPR 635	Research Methods in Health, Physical Education, Recreation, and Sports	3

Research-Problem Track (43 credits)

ESPR 636	Research Problems in Health, Physical Education, Recreation, and Sports	3
ESPR 667	Internship in Health, Physical Education, Recreation, and Sports: Teacher Candidate Internship	1-6
HPE 587	Teacher Candidate Seminar	1
Electives		33

Elective Courses

ESPR 618	Current Research in Athletic Training	1
ESPR 623	Athletic Training Practicum I	1
ESPR 628	The Spine: Evaluation and Rehabilitation	3
ESPR 633	Athletic Training Practicum II	1
ESPR 643	Athletic Training Practicum III	1
ESPR 653	Athletic Training Practicum IV	1
HE 581	Teaching Sex Education in the Schools	3
ESPR 605	Principles of Movement Analysis in Team Sports	3
ESPR 607	Principles of Movement Analysis in Individual Sports	3
ESPR 609	Movement Analysis of Dance/Rhythm Activity	3
ESPR 680	Problems in Health Education	3
ESPR 740	Principles and Concepts of Motor Learning	3
ECI 608	Philosophical Foundations of Education	3
ECI 680	Reading to Learn Across the Curriculum	3

A passing score on the PRAXIS II test of Content Knowledge in Physical Education and Health (Form 0856) must be on file in the Teacher Education Services office before the teacher candidate internship can begin. Passing scores on the Virginia Communication and Literacy Assessment will be required by the Virginia Department of Education for licensure.

Physical Education

Curriculum and Instruction Emphasis

2018 & 2030 Student Recreation Center

Bob Spina & Stephen Knott, Graduate Program Coordinators

Admission and Entrance Requirements. Students applying for admission with regular status must have (1) a bachelor's degree from an accredited institution with a cumulative undergraduate grade point average (GPA) of 2.80 and a GPA of 3.00 in the undergraduate major courses; (2) a score of at least 900 in the quantitative and verbal portions of the Graduate Record Examination (GRE) - GRE scores are required for consideration of admission for all candidates. (In some circumstances, students who have either a low GPA or a

low GRE score may be considered for admission with provisional status); and (3) demonstrated computer literacy.

Continuance and Exit Requirements. Students must meet all requirements for continuance as outlined in the graduate continuance policy for the University. Students completing the program of study must (1) achieve an overall GPA of 3.00 and a GPA of 3.00 in the major courses; (3) demonstrate writing proficiency; (4) satisfy all course competencies; (5) pass a comprehensive examination when required; (6) complete an internship, research project, or thesis as a culminating experience; (7) hold an exit interview with the program coordinator; and (8) file the necessary paperwork for graduation.

Curriculum. Requirements for the emphasis are as follows (36 credits):

Core Courses - 15 credits

ESPR 601	Adapted Physical Education Design and Supervision	3
ESPR 606	Planning and Administration of an Effective Health and Physical Education Program	3
ESPR 720	Curriculum Development in Physical Education	3
ESPR 739	Current Research in Motor Development	3
ESPR 740	Principles and Concepts of Motor Learning <i>or</i>	
ESPR 745	Assessment and Evaluation in Physical Education	3

Research Core - 6 credits

ESPR 634	Statistics in Health, Physical Education, Recreation, and Sports	3
ESPR 635	Research Methods in Health, Physical Education, Recreation, and Sports	3

Thesis Track Courses - 15 credits

ESPR 698	Thesis	3
ESPR 699	Thesis Electives	9

Research-Problem Track - 15 credits

ESPR 636	Research Problems in Health, Physical Education, Recreation, and Sports	3
Electives		12

Non-Research Track - 15 credits

ESPR 667	Internship in Health, Physical Education, Recreation, and Sports: Teacher Candidate Internship	1-6
Electives		9

All students must complete nine hours of electives chosen from the following courses or substituted from relevant courses in ECI, ELS, or ESSE with permission of the advisor.

Electives

ESPR 680	Problems in Health Education	3
ESPR 739	Current Research in Motor Development <i>or</i>	
ESPR 740	Principles and Concepts of Motor Learning	3
HE 581	Teaching of Sex Education in the School	3
EXSC 509	Physiology of Exercise	3
ESPR 605	Principles of Movement Analysis in Team Sports for Physical Education	3
ESPR 607	Principles of Movement Analysis in Individual Sports for Physical Education	3
ESPR 609	Principles of Movement Analysis in Dance for Physical Education	3
ECI 608	Philosophical Foundations of Education	3
ECI 680	Reading to Learn Across the Curriculum	3

Physical Education

Curriculum and Instruction with Initial Virginia Licensure in Physical Education and Health Education

2030 Student Recreation Center

757-683-3545

Stephen Knott, Graduate Program Coordinator

Admission and Entrance Requirements. Students applying for admission with regular status must have (1) a bachelor's degree from an accredited institution with a cumulative undergraduate grade point average (GPA) of 2.80 and a GPA of 3.00 in the undergraduate major courses; (2) a score of at least 900 in the quantitative and verbal portions of the Graduate Record Examination (GRE) - GRE scores are required for consideration of admission for all candidates; (3) a composite score of 532 on the PRAXIS I (PPST in reading,

writing, and mathematics) or State Board approved equivalent SAT or ACT score for admission to the program and acceptance into teacher education; and (4) demonstrated computer literacy. (In some circumstances, students who have either a low GPA or a low GRE score may be considered for admission with provisional status)

Continuance and Exit Requirements. Students must meet all requirements for continuance as outlined in the graduate continuance policy for the University. Students completing the program of study must (1) achieve an overall GPA of 3.00 and a GPA of 3.00 in the major courses; (2) demonstrate writing proficiency; (3) satisfy all course competencies; (4) pass a comprehensive examination when required; (5) complete an internship, research project, or thesis as a culminating experience; (6) hold an exit interview with the program coordinator; and (7) file the necessary paperwork for graduation and teacher licensure.

Curriculum. Specific requirements for the program are as follows (36 total credits with additional credits up to 54 as needed to satisfy Virginia licensure requirements):

Core Courses - 15 credits

ESPR 601	Adapted Physical Education Design and Supervision	3
ESPR 606	Planning and Administration of an Effective Health and Physical Education Program	3
ESPR 720	Curriculum Development in Physical Education	3
ESPR 739	Current Research in Motor Development	3
	OR	3
ESPR 740	Principles and Concepts of Motor Learning	
ESPR 745	Assessment and Evaluation in Physical Education	3

Research Core - 6 credits

ESPR 634	Statistics in Health, Physical Education, Recreation, and Sports	3
ESPR 635	Research Methods in Health, Physical Education, Recreation, and Sports	3

Non-research Track – 16 to 34 credits

ESPR 667	Internship in Health, Physical Education, Recreation, and Sports: Teacher Candidate Internship	6
HPE 587	Teacher Candidate Seminar	1
	Electives	9-20

A passing score on the PRAXIS II test of Content Knowledge in Physical Education and Health (Form 0856) must be on file in the Teacher Education Services office before the teacher candidate internship can begin. Passing scores on the Virginia Communication and Literacy Assessment will be required by the Virginia Department of Education for licensure.

Elective Courses (at least 9 credits)

All students must complete nine hours of electives chosen from the following courses or substituted from relevant courses in ECI, ELS, or ESSE with permission of the advisor. Additional credits above nine hours will be needed to satisfy licensure requirements. All Virginia Department of Education requirements must be satisfied for a teaching licensure to be issued.

ESPR 680	Problems in Health Education	3
ESPR 739	Current Research in Motor Development or	
ESPR 740	Principles and Concepts of Motor Learning	3
HE 581	Teaching of Sex Education in the School/Community	3
EXSC 509	Physiology of Exercise	3
ESPR 605	Principles of Movement Analysis in Team Sports for Physical Education	3
ESPR 607	Principles of Movement Analysis in Individual Sports for Physical Education	3
ESPR 609	Principles of Movement Analysis in Dance for Physical Education	3
ECI 608	Philosophical Foundations of Education	3
ECI 680	Reading to Learn Across the Curriculum	3

Additional requirements for teacher licensure students:

HE 230	Personal and Community Health	3
HE 224	Advanced First Aid and Emergency Care	3
BIOL 108N	Life Science I or	
BIOL115N	General Biology I	4
BIOL 250	Human Anatomy and Physiology I	4
EXSC 322	Anatomical Kinesiology/Human Anatomy	4

Note: The following Driver's Education Endorsement courses are strongly advised for any candidate wishing to teach at the secondary level:

PE 308	Driver Foundations of Traffic Safety	3
PE 309	Principles and Methods Class in Car	3

Exercise Science and Wellness Emphasis

2024 Student Recreation Center
757-683-4514

Elizabeth A. Dowling, Graduate Program Director

This emphasis is designed for the student who desires to pursue advanced study in the scientific areas of health and physical education. The course work will help to strengthen the background of those individuals already involved in conducting fitness programs for various age groups or to prepare individuals for careers in other health-related fields that utilize exercise as preventive medicine.

Admission and Entrance Requirements. Students applying for admission with regular status must have (1) a bachelor's degree from an accredited institution with a cumulative undergraduate GPA of 2.8 and a GPA of 3.00 in the undergraduate major courses; and (2) have a score of at least 900 between quantitative and verbal on the Graduate Record Examination (GRE). Students who have either a low GPA or a low GRE score may be considered for admission to provisional status. GRE scores are required for consideration of admittance. Additionally, students must be computer literate. Prerequisites include physiology and exercise physiology.

Continuance and Exit Requirements. Students must meet all requirements for continuance as outlined in the graduate continuance policy for the University. Students completing the program of study must (1) have an overall grade point average of 3.00; (2) have a grade point average of 3.00 in the major; (3) demonstrate writing proficiency; (4) satisfy all course competencies; (5) pass a comprehensive examination; (6) complete an internship or research project/thesis; (7) have an exit interview with the program director; and (8) file the necessary paperwork for graduation.

Requirements for the emphasis are as follows (36 credits):

Core Courses (16 credits)

EXSC 517	Advanced Kinesiology and Biomechanics	3
EXSC 528	Exercise Prescription for Chronic Diseases	3
ESPR 630	Exercise Physiology	3
ESPR 642	Clinical Exercise Testing and Prescription	3
ESPR 661	Seminar in Nutrition for Sports and Health	3

Research Core (6 credits)

ESPR 634	Statistics	3
ESPR 635	Research Methods	3

Requirements for different tracks are as follows:

Thesis Track (14 credits)

ESPR 698	Thesis	3
ESPR 699	Thesis	3
	Electives	8

Research Problem Track (14 credits)

ESPR 636	Research Problems	3
	Electives	11

Non-Research Track (14 credits)

ESPR 667	Internship	6
	Electives	8

Supportive electives may be chosen from a restricted list of courses in health, physical education and recreation, sports management, biology, or other areas of relevant study. The student will also select either a research or internship option.

Recreation and Tourism Studies Emphasis

2010 Student Recreation Center
757-683-6309

Edwin Gomez, Graduate Program Director

This emphasis is designed to prepare students and practitioners for advanced study in the research, management, and administration of managed recreation and tourism services. These individuals will be provided with the ability to implement social and economic impact research as well as pursue diverse careers within the industry.

Distance Learning Option

Old Dominion University is a leader in distance learning programs (<http://dl.odu.edu/>). The RTS Distance Learning Graduate Program is designed for the working professional, local or out of state. The program offers a tailored format to prepare professionals for career advancement in the Recreation and Tourism industry. Graduate faculty are available for advising via email or over

the phone. The curriculum is flexible without compromising the integrity of the educational process. The primary tools used for the RTS Distance Learning Program are Blackboard (<http://blackboard.odu.edu>), iTunes/iTunes University: Old Dominion University (www.itunes.com), and LEO Online (https://www.leonline.odu.edu/plsql/web/twbkwbis.P_GenMenu?name=home page). In addition, we use other basic computer programs (e.g., PowerPoint)

Admission. Students applying for admission with regular status must have (1) a bachelor's degree from an accredited institution with a cumulative undergraduate GPA of 2.8 and a GPA of 3.00 in the undergraduate major courses; and (2) a score of at least 900 between quantitative and verbal on the Graduate Record Examination (GRE). Students who have either a low GPA or a low GRE score may be considered for admission to provisional status. GRE scores are required for consideration of admittance. Additionally, students must be computer literate.

Continuance and Exit. Students must meet all requirements for continuance as outlined in the graduate continuance policy for the University. Students completing the program of study must (1) have an overall grade point average of 3.00; (2) have a grade point average of 3.00 in the major; (3) demonstrate writing proficiency; (4) satisfy all course competencies; (5) pass a comprehensive examination; (6) complete an internship or research project/thesis; (7) have an exit interview with the program coordinator; and (8) file the necessary paperwork for graduation.

Curriculum. Requirements for the emphasis are as follows (36 credits):

Core Courses (12 hrs; choose 4 of 8 courses)

RTS 541*	Service & Operation Strategies in Tourism & Recreation (Summer)	3
RTS 561*	Tourism and Hospitality Industry (Spring)	3
RTS 575*	Tourism and Cultural Heritage Management (Fall)	3
RTS 611*	Grant Writing in ESPER (Summer)	3
RTS 616*	Theory and Application in Recreation & Tourism (Sp)	3
RTS 619*	Strategic Marketing in Recreation and Tourism	3
RTS 650*	Readings in Contemporary Issues in Recreation, Sport, Health, and Physical Education	3
RTS 695*	Youth Development through Recreation (Summer)	3
Research Core (6 credits)		
ESPR 634*	Statistics in Health, Physical Education, Recreation, and Sports	3
ESPR 635*	Research Methods in Health, Physical Education, Recreation, and Sports	3
Optional Courses (9 credits; choose 3 of the 13):		
CHP 600*	Principles of Community Health (Spring)	3
CHP 702*	Health Care Delivery Systems (Spring)	3
COUN 631	Counseling for Lifespan Development	3
COUN 655	Social/Cultural Issues in Counseling	3
PADM 671	Public Budgeting and Financial Management	3
PADM 711	Urban Services Administration	3
PADM 715	Management of Nonprofit Organizations	3
PADM 719	Leadership	3
RTS 638	Fiscal Planning and Management in Sport & Rec	3
RTS 660	Legal Aspects of Sport, Rec, Health, & PE	3
SOC 612	Urban Society in Transition	3
URBN 632	Environmental Planning	3
URBN 705	Urban Law and Public Policy	3

Courses in the core that have not already been taken may also be used.

Electives (3 credits)

Courses in the core that have not already been taken may be used. Must be approved by the faculty advisor.

Requirements of the different tracks are as follows:

Research Track (6 credits)

ESPR 698*	Thesis	3
ESPR 699*	Thesis	3

Research Problem Track (6 credits)

ESPR 636*	Research Problems in Health, Physical Education, Recreation, and Sports	3
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Non-research Track (6 credits)

ESPR 667*	Internship in Health, Physical Education, Recreation, and Sports	6
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* Indicates Distance Learning Option

Sport Management Emphasis

2025 Student Recreation Center
757-683-5962

Robert Case, Graduate Program Director

The emphasis is designed to prepare students for roles in sport management and administration. This program is approved and accredited through the North American Society for Sport Management (NASSM) and the National Association for Sport and Physical Education (NASPE).

Admission and Entrance Requirements. Students applying for admission with regular status must have (1) a bachelor's degree from an accredited institution with a cumulative undergraduate GPA of 2.8 and a GPA of 3.00 in the undergraduate major courses; and (2) have a score of at least 900 between quantitative and verbal on the Graduate Record Examination (GRE). Students who have either a low GPA or a low GRE score may be considered for admission to provisional status. GRE scores are required for consideration of admittance. Additionally, students must be computer literate.

Continuance and Exit Requirements. Students must meet all requirements for continuance as outlined in the graduate continuance policy for the University. Students completing the program of study must (1) have an overall grade point average of 3.00; (2) a grade point average of 3.00 in the major; (3) demonstrate writing proficiency; (4) satisfy all course competencies; (5) pass a comprehensive examination; (6) complete an internship or research project/thesis; (7) have an exit interview with the program director; and (8) file the necessary paperwork for graduation.

Curriculum. Requirements for the emphasis are as follows (36 credits):

Core Courses - 24 credits

SMGT 550	Ethics in Sport Management	3
SMGT 553	Sport Sponsorship and Event Planning	3
SMGT 555	Sport in Contemporary Society	3
SMGT 638	Fiscal Planning and Management in Sport and Recreation	3
SMGT 646	Sport Marketing	3
SMGT 652	Sport Facility Management	3
SMGT 660	Legal Aspects of Sport	3
SMGT 675	Leadership and Management in Sport	3

Research Core - 6 credits

ESPR 634	Statistics in Health, Physical Education, Recreation, and Sports	3
ESPR 635	Research Methods in Health, Physical Education, Recreation, and Sports	3

Requirements for the different tracks are as follows:

Thesis Track Course - 6 credits

ESPR 698	Thesis	3
ESPR 699	Thesis	3

Research-Problem Track - 6 credits

ESPR 636	Research Problems in Health, Physical Education, Recreation, and Sports	3
Electives		3
Non-Research Track Courses		6
SMGT 664	Fieldwork Experience in Sport Management	6

Doctor of Philosophy in Education – Human Movement Science Emphasis

2003A Student Recreation Center
757-683-3516

Bonnie L. Van Lunen, Graduate Program Director

The Department of Exercise Science, Sport, Physical Education and Recreation offers a Ph.D. in human movement science, with emphases in curriculum and instruction, and applied kinesiology concepts. The degree is intended to prepare individuals for faculty research and administrative positions within departments that offer programs such as athletic training, health and physical education, exercise science, curriculum and instruction, physical therapy, and biomechanics.

Admission and Entrance Requirements. Criteria for admission into the Ph.D. in Education concentration human movement science are as follows: (1) a completed application form (contact the Office of Graduate Admissions for application materials); (2) official transcripts of all undergraduate and graduate courses and degrees completed. To be considered for the program, applicants must have completed bachelor's and master's degrees in an appropriate discipline from accredited colleges or universities. (3) official report scores from the Graduate Record Examination (verbal, quantitative, and analytical scores) taken within the last five years; (4) submission of additional materials as outlined in the Graduate Student Handbook for the concentration (found on web page); (5) completion of prerequisite or equivalent coursework - Research Methods (ESPR 635) and Statistics Applied to Research in Educational

Department of Science, Technology, and Mathematics Education and Professional Studies

228 Education Building
757-683-4305

Phillip Reed, Chair

The Department of Science, Technology, and Mathematics Education and Professional Studies is an academic leader in graduate studies related to career and technical education teaching, including marketing education, science education, mathematics education, technology education, community college teaching, and human resources training. It offers the M.S. and the Ph.D. in Education with concentrations in occupational and technical studies and instructional design technology. The department also offers licensure and teaching endorsement programs. Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in the catalog. Students should obtain current program information from their advisors and the Darden College of Education website at <http://education.odu.edu/>.

Individual programs are described on the following pages.

Master of Science in Occupational and Technical Studies, with concentrations in:

- Career and Technical Education Teaching
- Business and Industry Training
- Community College Teaching

Master of Science in Education for Licensed Teachers - Elementary/Middle School – Science

Master of Science in Education with Initial State Licensure 6-12

Endorsement Program in Industrial Cooperative Training

Licensure Program in Marketing Teacher Education

Licensure Program in Technology Education through M.S. Degree

Endorsement Program in Vocational Special Needs Education

Endorsement Program in Vocational Evaluation

Master of Science in Engineering-Modeling and Simulation

- Concentration, Simulation-Based Instruction

Education Specialist

Doctor of Philosophy in Occupational and Technical Studies

Instructional Design and Technology Programs

- o Master of Science in Education - Elementary/Middle School – Instructional Design and Technology emphasis
- o Master of Science in Education - Secondary – Instructional Design and Technology emphasis
- o Doctor of Philosophy in Instructional Design and Technology

Master of Science-Occupational and Technical Studies

John M. Ritz, Graduate Program Director

This is an advanced master's degree and requires prior academic work associated with this area of study. The M.S. program has three concentrations - career and technical education teaching, business and industry training, and community college teaching. These studies are designed to help teachers and trainers upgrade their knowledge and skills and prepare for leadership roles in education and training. These programs are all delivered at the Norfolk campus and through the University's distance learning system.

Admission. Students are admitted to the program on a continuing basis. Applications can be obtained from the Admissions Office, distance learning sites, the department and online. Students are admitted for fall, spring, and summer on a rolling basis. Graduate students can complete up to 12 graduate

Leadership – Data Driven Decision Making I (ELS 732). A screening committee will review the submitted application materials and determine eligibility for the program. An interview with the screening committee will be required of all candidates. Admission is competitive and the number of openings is limited.

Continuance and Exit Requirements. Students must meet all requirements for continuance as outlined in the graduate continuance policy for the University. Students completing the program of study must (1) have an overall grade point average of 3.00; (2) satisfy all course competencies; (3) pass comprehensive examinations; (4) meet all benchmarks set forth by the director; (5) complete a dissertation; (6) have an exit interview with the program director; and (7) file the necessary paperwork for graduation.

Curriculum. Requirements for the concentration are as follows (minimum of 60 credits):

Degree Prerequisite: A master's degree in an appropriate field related to this concentration is required for regular admission to the Ph.D. in human movement science.

Prerequisite Coursework: Students who do not have equivalent coursework or appropriate educational experiences must complete the following prerequisite courses.

ESPR 635	Research Methods in Health, Physical Education and Recreation	3
ELS 732	Statistics Applied to Research in Educational Leadership – Data Driven Decision Making I	3

Introductory Core - 6 credits

ESPR 814	Readings and Research in Content Area	3
ESPR 815	Introduction to Doctoral Study Seminar	3

Research Core - 15 credits

ELS 832	Statistics Applied to Research in Educational Leadership – Data Driven Decision Making II	3
ELS 833	Advanced Research Design and Analysis	3
ECI 890	Qualitative Research Design	3

Choose two additional courses*:

CHP 773	Developing Grants/Contract in Health Professions	3
HLSC 846	Epidemiology	3
HLSC 815	Decision Analysis – Health Care	3
HIED 877	Advanced Program Assessment and Evaluation	3

* Substitute other courses by permission of advisor

Human Movement Science concentration (24 credits, 15 required credits + choice of cognate area)

ESPR 811	Analysis of Human Motion	3
ESPR 895	Topics: Research Experience I	3
ESPR 896	Topics: Research Experience II	3

Choose two of the following:

ESPR 840	Principles and Concepts of Motor Learning	3
ESPR 839	Current Research in Motor Development	3
ESPR 855	Neuroanatomical Basis of Human Movement	3

Curriculum and Instruction Emphasis - 9 credits

(HPE Teacher Prep only: Elective from stats, ESPR 845, additional course below)

HIED 808	Contemporary Issues in Higher Education	3
HIED 837	Academic Issues in Higher Education	3
HIED 858	Higher Education Leadership	3
HIED 859	Higher Education Curriculum or Curriculum Development in Physical Education	3
ESPR 820	Curriculum Development in Physical Education	3
ESPR 845	Assessment and Evaluation in Physical Education	3

Applied Kinesiology Concepts Emphasis (9 credits)

ME 842	Fatigue and Fracture	3
ME 846	Computational Methods in Multibody Dynamics	3
ME 848	Kinematic Synthesis of Mechanisms	3
PSYC 831	Human Cognition	3
PSYC 871	Ergonomics	3
ESPR 825	Clinical Biomechanics for Rehabilitation Professionals	3

*Substitutions can be made with approval from the graduate program director

Dissertation Capstone Courses - 15 credits

ELS 881	Dissertation Seminar	3
ESPR 899	Dissertation	12 (minimum)

hours with a non-degree application. All applicants to the Master of Science degree in occupational and technical studies must meet University, college and department requirements. In addition, all applicants must: (1) hold an undergraduate degree in a related field or have work experience in an occupational/technical area, (2) have an overall grade point average of 2.80 with a 3.00 in major courses, (3) complete the Graduate Record Examination (GRE) with a score of 900 (verbal and qualitative sections combined) or the Miller Analogy Test with a 45 percentile in the intended major, and (4) submit two letters of recommendation.

Continuance: Students must (1) complete the Graduate Writing Proficiency Examination administered by the department prior to completing nine credit hours and (2) maintain a minimum grade point average of 3.00.

Exit: Students in the career and technical education teaching and business and industry training concentrations must complete 33 semester hours and students in the community college teaching concentration must complete 39 semester hours, as distributed in the M.S. curriculum. In addition, all students must (1) achieve an overall grade point average of 3.00; (2) complete all competencies listed on course syllabi; (3) pass the written comprehensive examination; (4) successfully complete a problems paper or thesis; and (5) complete a University graduate student assessment.

Curriculum – 33 to 39 credits

Common Core – 9 credits

OTED 785	Curriculum Development in Occupational Education and Training	3
OTED 788	Instructional Strategies and Innovations in Training and Occupational Education	3
OTED 789	Instructional Technology for Education and Training	3

Concentration Specific Courses – 6 credits, select one specialization

Career and Technical Education Teaching

OTED 760	Trends and Issues in Occupational Education	3
OTED 762	Administration and Management of Education and Training Programs	3

Business and Industry Training

OTED 761	Foundation of Adult Education and Training	3
OTED 762	Administration and Management of Education and Training Programs	3

Community College Teaching

OTED 760	Trends and Issues in Occupational Education	3
OTED 761	Foundation of Adult Education and Training	3

Research Core 6-9 credits

OTED 635	Research Methods in Occupational and Technical Studies	3
OTED 636	Problems in Occupational and Technical Studies, or	
OTED 698	Thesis in Occupational Education	3-6

Professional Technical Specialty - 12-18 credits

Career and Technical Education Teaching - 12 credits, approved by advisor

Business and Industry Training - 12 credits, approved by advisor

Community College Teaching - 18 credits in teaching specialty

Master of Science in Education for Licensed Teachers - Elementary/Middle School– Science

The following program is for licensed teachers who wish to enter a degree program leading to the Master of Science in Education degree and to specialize in science education. Nondegree students intending to enter this graduate program must meet with the elementary/middle school graduate program director upon completion of no more than six graduate credits.

Admission, continuance and exit requirements are the same as the general elementary/middle school program for licensed teachers that are listed directly above this section. This emphasis is for licensed teachers who wish to expand their education in science. Thirty-one credits are required for graduation.

Core: (16-18 credits)

ECI 430/530	Instructional Technology in the Classroom PK-12	3
Taken within five years or waived through examination		
Instructional Strategies in Science		
(one or more of the following)		
ECI 654	Science in the Elementary/Middle School	3
ECI 554	Developing Instructional Strategies for Teaching in the Middle/High School: Science	
	Science courses	10 to 12

Science courses must have a science department prefix and be approved by the student's science education advisor.

Support Courses: (6-8 credits)

Selected in consultation with the advisor and/or graduate program director.

Research (6 credits): Problems paper		
ECI 635	Research Methods In Education	3
ECI 636	Problems in Education	3

Master of Science in Education with Initial State Licensure 6-12

There are a number of individuals who have earned B.S. or B.A. degrees who now want to obtain a master's degree leading to licensure as a secondary school teacher. In the program, students complete (or have completed) a minimum of 32 credits of undergraduate courses in one endorsement area (mathematics, social studies, English, earth science, chemistry, biology, or physics) and an additional 31-34 credits of education courses at the graduate level.

The graduate education component provides preparation in social and cultural foundations of education, adolescent development, classroom management, reading in the content area, microcomputers and curriculum, instructional strategies for secondary school, special needs students, research in curriculum and instruction, and a 14-week internship/student teaching experience. Courses include ESSE 506, 513, ECI 530, 608, 619, 640, 669, 680 and one instructional strategies course chosen from ECI 551 (English), 553 (Math), 554 (Science), 555 (Social Studies).

For the subject specialty, academic course requirements must be met in one of the following endorsement areas: mathematics, social studies, English, English as a second language, earth science, chemistry, biology, or physics.

Admission, Continuance, and Exit Requirements

Admission. Students must (1) hold a bachelor's degree from a regionally accredited college/university; (2) achieve passing scores (as established by the Commonwealth of Virginia) on the Praxis I Academic Skills Assessment or Board-approved SAT/ACT scores; (3) have a cumulative grade point average of 2.80; (4) take and receive satisfactory scores on either the Graduate Record Examination (score of 900 combined on verbal and quantitative for regular admission) or Miller Analogies Test (minimum score of 45 or 399 for regular admission); (5) have an interview with the graduate program director; and (6) submit an application for graduate studies. Performance in classes taken as a non-degree student will not be taken into consideration in the admission process. No courses in the academic major or professional education in which the student has made below a C- will be accepted for licensure in the Darden College of Education.

Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for secondary education.

Continuance. Students must (1) maintain a grade point average of 3.00; (2) maintain a grade point average of 3.00 in the major; (3) receive a B or better in practicum to participate in teacher internship; and (4) pass Praxis II prior to the teacher internship. Passing scores must be attached to the teacher internship application.

Exit. Students must (1) have a 3.00 grade point average; (2) pass a written comprehensive examination; (3) have an exit interview; (4) have completed all course requirements; (5) submit an application for graduation, and (6) pass the Virginia Communication and Literacy Assessment (VCLA) prior to licensure. No courses in the academic major or professional education in which the student has made below a C- will be accepted for licensure requirements in the Darden College of Education.

Graduate Professional Education Classes

ESSE 506	Students with Diverse Learning needs in the General Education Classroom	3
ESSE 513	Fundamentals of Human Growth and Development	3
ECI 430/530	Instructional Technology in the Classroom PK-12	3
ECI 608	Philosophical Foundations of Education	3
ECI 619	Classroom Research and Assessment in Curriculum and Instruction	3
ECI 640	The Management of Learning and Instruction	3
ECI 669	Internship/Student Teaching	3-9
ECI680	Reading to Learn Across the Curriculum	3
One instructional strategies course corresponding to the content specialty chosen from for following:		
ECI 551	Developing Instructional Strategies for Teaching in the Middle/HS: English	3
ECI 553	Developing Instructional Strategies for Teaching in the Middle/HS: Mathematics	3

ECI 554	Developing Instructional Strategies for Teaching in the Middle/HS: Science	3
ECI 555	Developing Instructional Strategies for Teaching in the Middle/HS: Social Studies	3

Licensure Program in Technology Education through M.S. Degree

John M. Ritz, Graduate Program Director

The licensure program in technology education is designed to prepare a person who has a baccalaureate degree and industrial/military related technical experience to be a technology education teacher. Participants who successfully complete this program will qualify to apply for a Virginia teaching license to teach technology education and also receive a Master of Science degree.

Admission Information. To earn the M.S. with Virginia licensure to teach technology education, candidates have to be accepted into the M.S. concentration in career and technical education teaching. Graduate students can complete up to 12 graduate hours with a non-degree application. Student must meet with the graduate program director to have military and other technical content courses reviewed to determine their applicability toward licensure requirements. Prior to entering this program students must hold a baccalaureate degree with a major related to technology/engineering or have completed military schools equating to a minimum of 18 credits in industrial technology areas as evaluated by the American Council on Education (ACE Guide). Students must also have completed a rigorous general education program as outlined by the Commonwealth in its Licensure Regulations for Teachers. They must be interviewed and accepted by the graduate program director. Finally students must attain or exceed the minimum score required by Virginia on the PRAXIS I examination or equivalent SAT or ACT score. The PRAXIS I exam (or equivalent SAT or ACT score) must be passed prior to admittance into teacher education and taking OTED 508, Advanced Classroom Issues and Practices.

Continuance and Exit. Students must (1) complete the following courses: ESSE 677; ECI 608 (Foundations of Education and Instructional Assessment); 680 (Reading to Learn Across the Curriculum); 616 (Design for Effective Instruction); OTED 508, 586, 596, 635, 636, 730, 788, 789; OTS 112, 231, 320, 350, 351; (2) earn a 2.75 cumulative grade point average on undergraduate level courses and a 3.00 cumulative grade point average at the graduate level, (3) earn passing scores on PRAXIS II and Virginia Communication and Literacy Assessment Test before the teacher internship; and (4) complete the graduate student University assessment. Completing this licensure program and other departmental requirements will allow the candidate to earn the Master of Science in occupational and technical studies, career and technical education teaching concentration.

Endorsement Program in Vocational Special Needs Education

Sharon R. Davis, Coordinator

The endorsement program in vocational special needs education is designed to prepare a person who holds a teaching license in a secondary education career and technical education program to teach vocational special needs education courses in Virginia. Students who successfully complete this program may apply for the Vocational Special Needs Add-on Endorsement.

Admission. Students may enroll in this teaching endorsement program as a non-degree student. If an M.S. degree is sought, so graduate level courses may be applied toward the professional technical studies component of the degree, admission should be sought into the M.S. program in occupational and technical studies with a concentration in career and technical education teaching. Graduate students can complete up to 12 graduate hours with a non-degree application. Students should contact the program coordinator to discuss admissions options. Prior to entering this program students must be endorsed to teach career and technical education or special education in the public schools. Secondly, they must have completed a course in English composition. Finally, they must be interviewed and accepted by the coordinator for the program.

Continuance and Exit. Students must (1) complete the following courses: OTED 408/508, OTED 603, and OTED 604; (2) earn a 3.00 cumulative grade point average; and (3) document at least 4000 clock hours of occupational work experience completed within the past five years or complete OTS 405. Nine hours of 500/600 level courses may be applied toward the Master of Science in occupational and technical studies, career and technical education teaching concentration.

Licensure/Endorsement Programs

Endorsement Program in Industrial Cooperative Training

John M. Ritz, Coordinator

The endorsement program in industrial cooperative training is designed to prepare a licensed teacher to be endorsed to teach industrial cooperative training in the public schools.

Admission. Students may enroll in this teaching endorsement program as a non-degree student. If an M.S. degree is sought, some graduate level courses may be applied toward professional technical studies in this component of the degree, admission should be sought into the M.S. program in occupational and technical studies with a concentration in career and technical education teaching. Graduate students can complete up to 12 graduate hours with a non-degree application. Students should contact the program coordinator to discuss admissions options. Prior to entering this program, students must have or qualify for a Virginia Collegiate Professional or Postgraduate Professional License. Secondly, they must be interviewed and accepted by the program coordinator.

Continuance and Exit. Students must (1) complete the following courses: OTED 305/400/500, OTED 401/501, OTED 306, OTED 408/508, OTED 425/525, and OTS 450/550; (2) earn a 2.75 cumulative grade point average if licensure is at the undergraduate level and a 3.00 cumulative grade point average if licensure is at the graduate level; and (3) document at least 4000 clock hours of acceptable employment in a trade, technical, or industrial education subject area completed within the past five years or complete OTS 405. Twelve hours of 500 level courses may be applied toward the Master of Science in occupational and technical studies, career and technical education teaching concentration.

Licensure Program in Marketing Teacher Education

Michael F. Kosloski, Coordinator

The licensure program in marketing teacher education is designed to prepare a person who has a business-related baccalaureate degree to be a marketing education teacher-coordinator. Participants who successfully complete this program will qualify to apply for a Virginia teaching license to teach marketing education.

Admission. Students can complete this licensure program through an undergraduate degree program, second undergraduate degree, graduate non-degree seeking level, or through the M.S. program. Students should meet with the program coordinator to discuss these options. Graduate students can complete up to 12 graduate hours with a non-degree application. Prior to entering this program students must hold a business-oriented baccalaureate degree in which 30 hours of marketing-related courses have been completed including at least three semester hours each of courses covering the marketing process, economics, personnel, the sales process, operations and organization, and promotion. Students must also have completed a rigorous general education program as outlined by the Commonwealth in its Licensure Regulations for Teachers. They must be interviewed and accepted by the marketing education program leader. Finally, students must attain or exceed the minimum score required by Virginia on the PRAXIS I examination or equivalent SAT or ACT score. The PRAXIS I exam (or equivalent SAT/ACT score) must be passed prior to admittance into teacher education and taking OTED 408/508.

Continuance and Exit. Students must (1) complete the following courses: OTED 297, ESSE 313/677, ECI 408 or 680, OTED 400/500, OTED 401/501, OTED 408/508, OTS 450/550, and OTED 485; (2) earn a 2.75 cumulative grade point average if licensure is at the undergraduate level and a 3.00 cumulative grade point average if licensure is at the graduate level; (3) document at least 4000 clock hours of marketing-related work experience completed within the past five years or complete OTS 405; (4) earn passing scores on PRAXIS II and the Virginia Communication and Literacy Assessment Test before teacher internship; and (5) complete a university graduate student assessment if enrolled in the M.S. degree program. Twelve hours of 500/600 level courses may be applied toward the Master of Science in occupational and technical studies, career and technical education teaching concentration.

Endorsement Program in Vocational Evaluation

John M. Ritz, Coordinator

The endorsement program in vocational evaluation is designed to prepare applicants to be endorsed as a vocational evaluator for employment in Virginia public schools.

Admission. Students may enroll as a non-degree seeking graduate student or apply to the M.S. program in occupational and technical studies, career and technical education teaching concentration. Students should contact the program coordinator to discuss these options. Prior to entering this program students must have or be working toward a master's degree in career and technical education evaluation, vocational education, special education, rehabilitation counseling, or related area. Secondly, they must be interviewed and accepted by the program coordinator.

Continuance and Exit. Students must (1) complete the following courses: OTED 550, OTED 603, OTED 604, OTED 606, and (2) earn a 3.00 cumulative grade point average. Twelve hours of 500/600 level courses may be applied toward the Master of Science in occupational and technical studies, middle and secondary teaching concentration.

Emphasis in Simulation-Based Instruction [Master of Science in Engineering Modeling and Simulation Concentration]

The Department of Occupational and Technical Studies offers the simulation-based instruction emphasis in the Master of Science in Engineering degree offered through the Batten College of Engineering and Technology. Working with subject matter experts and modeling/simulation technical experts, trainers play an important role in the design, development, and testing of training simulations. The professional trainer's role in simulations is to provide the training framework and pedagogy for the systematic development of training simulations. After the model or simulation has been designed, developed, and tested, the trainer becomes the prime user of the model or simulation as it is integrated into the trainer's instructional strategies.

The simulation-based instruction emphasis helps students understand the training process that should be followed in planning, designing, testing, and implementing a training simulation so that it solves a predetermined performance problem. The courses in the emphasis include:

OTED 761	Foundations of Adult Education/Training	3
OTED 789	Instructional Technology in Education and Training	3
OTED 750	Training Issues and Problems in Modeling and Simulation	3
ENMA 762	Training Systems Engineering	3

Students must also select three hours from OTED 762 or 788 and complete OTED 785 as the capstone course. Should they choose to do their research in instruction, students must complete OTED 635 and 636. For more information about the Master of Science in Engineering modeling and simulation concentration, refer to the Catalog section for the Batten College of Engineering and Technology.

Education Specialist-Occupational and Technical Studies

John M. Ritz, Graduate Program Director

The Department of Occupational and Technical Studies jointly offers the education specialist (Ed.S.) with the Department of Educational Leadership and Counseling. The program offers a cohesive sequence of academic studies designed to help graduates deal effectively with administrative problems encountered in urban schools and agencies. Principalship can be planned into the educational specialist degree.

Admission. To be admitted to the Ed.S. program, an applicant must:

1. Hold a master's degree in career and technical education or related field;
2. Have a successful experience as an administrator or teacher;
3. Hold a teaching license or equivalent; and
4. Have taken ELS 600 or its equivalent as a prerequisite.

Students seeking this degree need to apply through the Ed.S. program in the Department of Educational Leadership and Counseling.

Entrance: Students must (1) meet all University requirements, (2) provide two letters of recommendation; (3) hold a master's degree from an accredited institution (minimum 3.25 graduate grade point average), (4) provide a one-page

essay explaining why he/she should be admitted to the program; and (5) have an acceptable score on the GRE or Miller Analogies Test.

Continuance: Students must meet all University requirements and maintain a 3.00 or higher grade point average.

Exit: Students must successfully complete (1) a written comprehensive examination, (2) the required course of study, (3) have a 3.00 grade point average or above, and (4) complete a university graduate student assessment.

Curriculum - 33 credits

Requirements for the Ed.S. with a specialty in occupational and technical studies include 30-33 semester hours (18 hours must be completed in 800-level courses in ELS), as follows:

Prerequisites - 3-12 credits

ELS 600	Principal Orientation and Instructional Leadership	3
ELS 610	School Community Relations and Politics	3
ELS 621	Curriculum Development and Assessment	3
ELS 657	Public School Law	3

Note: ELS 610, 621, 765 are prerequisites for principalship endorsement.

Educational Leadership - 18 credits

ELS 853	Public School Finance	3
ELS 854	Human Resource Development and Evaluation	3
ELS 871	Educational Systems Planning and Futures	3
ELS 876	Ethics, Integrity and Social Justice in Education	3
ELS 878	Leadership in Teaching and Learning and Supervision or	
ELS 879	Field Research - School Administration	3

Occupational and Technical Studies - 15 credits

OTED 860	Trends and Issues in Occupational Education	3
OTED 862	Administration and Management of Educational and Training Programs	3
OTED 885	Curriculum Development in Occupational Education and Training	3
OTED 888	Instructional Strategies and Innovations in Training and Occupational Education	3
OTED 889	Instructional Technology Education and Training and/or other courses approved by the candidate's advisor	3

Doctor of Philosophy in Education - Occupational and Technical Studies Emphasis

John M. Ritz, Graduate Program Director

The Ph.D. in occupational and technical studies has three emphases: technology education, career and technical education, and human resources - training. The Ph.D. will be delivered on campus and through the University's distance learning system. It requires two summers where students enroll in nine credit hours for residency. All students must be on the Norfolk campus for two, two-week summer sessions. The focus of the degree is to prepare university faculty, directors/supervisors of career and technical education, and directors of training departments in business, industry, and government.

The Department of Occupational and Technical Studies has the faculty and expertise to support this concentration. It has six doctoral degreed faculty, all of whom have expertise in occupational and technical education: four with expertise in technology education, five with expertise in career and technical education, and five with expertise in human resources - training.

The curriculum associated with Old Dominion University's Ph.D. in occupational and technical studies is intended to accomplish the following learning outcomes:

Every individual who completes this doctoral program, regardless of his/her concentration emphasis, will develop competencies for understanding and using research methods and statistics to make data-based decisions.

The concentration emphasis will offer courses that enable graduates to know and apply their knowledge in today's complex educational environments and emerge as leaders in their chosen careers.

Admission. Students may enroll in this program full- or part-time. After admittance, students must be enrolled continuously. The program faculty reviews all applicants as their application packages are completed. The following weighted criteria are used for admittance: (1) graduate grade point average (15%); (2) undergraduate grade point average (15%); (3) Graduate Record Examination (30%) - minimum combined verbal and quantitative score of 1000; (4) essay, 1500 word, (10%); and (5) goodness of fit with program goals and supporting references (30%). Graduate assistantships and tuition grants are available. Contact the graduate program director for information.

Entrance. All applicants to the Doctor of Philosophy degree in occupational and technical studies must meet University, college and department requirements. In addition, all applicants must: (1) hold a master's

degree related to this field or have worked in occupations related to the degree's outcomes; (2) complete the graduate application with necessary fee; (3) submit an essay statement of academic and professional goals with an emphasis on how the Ph.D. degree in occupational and technical studies will contribute to the achievement of career goals; (4) submit three letters of reference from sources capable of commenting on readiness for advanced graduate study; (5) submit a resume that shows your educational and professional background; (6) submit academic transcripts from all undergraduate and graduate institutions previously attended or currently being attended with a minimum 3.00 graduate grade point average; (7) submit scores from the Graduate Record Examination that have been earned within the past five years with a minimum score of 500 in the verbal component; and, (8) if the applicant's primary language is not English, submit a current score for the Test of English as a Foreign Language (TOEFL) that meets the University's current standard. Applications for admission are on a rolling basis. Graduate assistantships are awarded in February annually.

Continuance. Students must (1) have their Ph.D. program approved; (2) meet residency requirements; (3) successfully complete annual progress reviews; (4) meet continuous enrollment requirements; (5) meet faculty and University program expectations; (6) complete the departmental Graduate Writing Proficiency Examination prior to the completion of nine credit hours; and (7) meet professional development and career preparation expectations.

Exit. Students must (1) complete a minimum of 60 credit hours beyond the master's degree; (2) complete all competencies listed on course syllabi; (3) achieve an overall grade point average of 3.00; (4) pass the written comprehensive examination, (5) select a dissertation committee; (6) prepare and defend a dissertation prospectus; (7) successfully complete a dissertation with an oral defense; and (8) complete the graduate student University assessment.

Prerequisites. A master's degree in an appropriate field related to this concentration is required for admission to the Ph.D. program. Students who do not have equivalent coursework or appropriate educational experiences must complete the following prerequisite courses:

OTED 635	Research Methods in Occupational and Technical Studies	3
ELS 732	Statistics Applied to Research in Educational Leadership – Data Driven Decision Making I	3
OTED 785	Curriculum Development in Occupational Education and Training	3
OTED 788	Instructional Strategies and Innovations in Training and Occupational Education	3
OTED 789	Instructional Technology in Education and Training	3

Curriculum – 60 credits minimum. Students in the occupational and technical studies concentration complete core courses in research, the occupational and technical studies concentration, electives, and an emphasis in either career and technical education, human resources development, or technology education.

Research Core - 12 credits

ELS 832	Statistics Applied to Research in Educational Leadership – Data Driven Decision Making II	3
ELS 833	Advanced Research Design and Analysis	3
ECI 890	Qualitative Research Design	3
OTED 835	Research Design for Occupational and Technical Studies	3

Concentration - 30 credits (OTED 860, 862, 865, 885, 888, and 889 plus one of the following emphasis areas)

OTED 860	Trends and Issues in Occupational Education	3
OTED 862	Administration and Management of Education and Training Programs	3
OTED 865	Trends and Issues in Economic and Workforce Development	3
OTED 885	Curriculum Development in Occupational Education and Training	3
OTED 888	Instructional Strategies and Innovations in Training and Occupational Education	3
OTED 889	Instructional Technology in Education and Training	3

Technology Education Emphasis - 12 credits

OTED 830	Introduction to Technology	3
OTED 831	Technical Systems	3
OTED 832	Program Development for Technology Education	3
OTED 840	Readings in Occupational and Technical Studies	3

Career and Technical Education Emphasis - 12 credits

OTED 840	Readings in Occupational and Technical Studies	3
OTED 868	Internship	3
OTED 887	Advanced Curriculum Design for Career and Technical Education	3

ELS 626	Instructional Supervision and Assessment	3
Human Resources – Training Emphasis - 12 credits		
OTED 840	Readings in Occupational and Technical Studies	3
OTED 850	Trends and Issues in Training: Modeling and Simulation	3
OTED 861	Foundations of Adult Education and Training	3
IDT 846	Distance Learning	3
Electives		
Electives are selected in consultation with the advisor. They should be planned and included in the student's program of study.		
Capstone Courses - 12 to 15 credits		
ELC 881	Dissertation Seminar (Only required for students who have not previously identified their dissertation topic.)	3
OTED 899	Dissertation	12

Master of Science in Education - Elementary/Middle School – Instructional Design and Technology Concentration

145 Education Building
757-683-3283

Gary Morrison, Graduate Program Director

In the Master of Science in Education – Elementary/Middle School -- instructional design and technology concentration, the core and support courses are combined, with students selecting 24 to 30 credits in instructional design and technology along with the problem paper or seminar research option. Working with an assigned advisor, students may take courses in the areas of distance education/telecommunications, instructional design and development, educational applications of instructional technology, and administration of instructional technology.

Admission, Continuance and Exit Requirements

Admission. Students must (1) hold a bachelor's degree from a regionally accredited college/university; (2) have a cumulative undergraduate grade point average of 2.80; (3) take and receive satisfactory scores on either the Graduate Record Examination (score of 900 combined on verbal and quantitative with a minimum of 400 verbal for regular admission) or Miller Analogies Test (minimum score of 45 or 399 for regular admission); and (4) have an interview with the graduate program director or his/her designee. Performance in classes taken as a non-degree graduate student will not be taken into consideration in the admission process. No courses in the undergraduate academic major or professional education in which the student has made below a C- will be accepted for licensure in the Darden College of Education.

Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for elementary/middle education.

Continuance. Students must (1) maintain a grade point average of 3.00; (2) maintain a grade point average of 3.00 in the major

Exit. Students must (1) have a 3.00 grade point average; (2) pass a written comprehensive examination; (3) have an exit interview; (4) have completed all course requirements; and (5) submit an application for graduation;

All ID&T students are expected to have regular and reliable access to a multimedia computer (headphones, microphone, and web cam) and a high speed Internet connection.

Program Requirements

Problem Paper Option: Area I (24 credits); Area II (6 credits); 30 credits total		
Seminar Option: Area I (30 credits); Area II (6 credits); 36 credits total		
Core: (24-30 credits chosen from courses below with the advisor's or graduate program director's approval in advance)		
ECI 430/530	Instructional Technology in the Classroom PK-12	3
ECI 634	Microcomputer Hardware Systems In Education	3
ECI 651	Software Evaluation and Curriculum	3
ECI 731	Instructional Technology Trends in Curriculum & Instruction	3
IDT 749	Instructional Systems Design	3
ECI 665	Digital Video Materials Development	3
IDT 761	Applied Instructional Design	3
IDT 746	Distance Education	3

ECI 647	Online Learning	3
ECI 748	Assessment and Evaluation in Content Areas	3
Support courses		
Graduate electives approved by the graduate program director may be substituted for technology classes when those courses complement personal and professional goals.		
Research Courses (6-12 credits)		
Problem Paper Option (6 credits; 30 credits required for graduation)		
ECI 635	Research Methods in Education	3
ECI 636	Problems in Education	3
Seminar Option (13 credits; 37 credits required for graduation)		
ECI 635	Research Methods in Education	3
ECI 639	Seminar in Education	3
Electives		6

Graduate electives approved by the graduate program director may be substituted when those courses complement personal and professional goals.

Area II: Research Core Courses Required

Problem Paper Option (30 graduate credits)

ECI 635	Research Methods in Education	3
ECI 636	Problems in Education	3

Seminar Option (36 graduate credits)

ECI 635	Research Methods in Education	3
ECI 639	Seminar in Education	3

Doctor of Philosophy in Education – Instructional Design and Technology Emphasis

The Doctor of Philosophy in Instructional Design and Technology (ID&T) prepares individuals to conduct research and assume leadership roles in the field of instructional technology. Students will master a number of ID&T skills, ranging from instructional problem identification, task and audience analysis, strategy design, assessment, evaluation, and implementation that they can use in settings including traditional classrooms and distance education. Courses explore theories and research that provide a foundation for the field. Students are also expected to participate in and conduct research studies as part of their program. Completing the Ph.D. in ID&T will prepare students to take jobs as practitioners in business, military, government, health care, and educational settings. They are also prepared to take positions as faculty members in higher education and as researchers for private organizations.

Admission. For admission to this program, individuals should have completed master's degree in an appropriate discipline from a regionally accredited university. Degrees that are equivalent to a master's degree such as L.L.B., J.D., and D.D.S. are also acceptable. Prospective students should also have prior course work in statistics and instructional technology. If this assumption is not met, then additional course work will be added to the candidate's graduate program of study. Please see prerequisites on the curriculum description for specifics.

Admission to the instructional design and technology Ph.D. program is competitive. A number of criteria are considered including graduate and undergraduate GPAs, GRE scores, writing ability, a personal interview, and the match between student interests and faculty expertise. Meeting the minimum requirements established by the department does not ensure admission to the program. A minimum undergraduate GPA of 2.8 and a minimum graduate GPA of 3.25 are recommended.

Application requirements for the Ph.D. in instructional design and technology are as follows:

1. a completed application which is available online or from the Office of Graduate Admissions.
2. Official transcripts of all undergraduate and graduate courses and degrees completed.
3. Official report scores from the Graduate Record Examination (verbal, quantitative, and analytical) taken within the last five years. GRE scores expire after five years; however, candidates who have completed the exam prior to five years before the application deadline may submit those scores for consideration if they are provided from an official source such as a transcript or form provided by the Educational Testing Service. Old Dominion University reserves the right to determine what is an "official source."
4. Applicants whose native language is not English (or who do not have a B.S. or M.S. degree from an accredited institution in a country where English is the native language) must submit a current score for the Test of English as a Foreign Language (TOEFL) of at least 600 (written) or 250 (computer based).
5. Applicants must submit a 1500 word statement of their academic and professional goals with an emphasis on how the Ph.D. degree in instructional design and technology will contribute to the achievement of the stated goals.
6. Three letters of reference from sources capable of commenting on the applicant's readiness for advanced graduate study. It is recommended that at least two of the letters come from university faculty members. Other letters may come from work supervisors or managers.
7. An interview with the instructional design and technology program faculty. This committee will also review applications for admission.

Program Requirements. The Ph.D. program in Education with a concentration in instructional design and technology is comprised of courses totaling a minimum of 60 academic credit hours beyond the master's degree. The curriculum includes an introductory core of six credit hours, an instructional design and technology core with a minimum of 24 credits hours, a research core of 15 credit hours, the three credit dissertation seminar and the

Master of Science in Education - Secondary – Instructional Design and Technology Concentration

The Master of Science in Education – Secondary - instructional design and technology concentration is designed to meet the needs of professionals interested or involved in the design, development and delivery of instruction. The courses are appropriate for a variety of venues, including preK-12, higher education, military, and business. In this specialization, student's select 24 to 30 credits in instructional design and technology plus the problems paper or seminar research option. Working with an advisor, students select courses that complement their backgrounds and professional goals.

Admission, Continuance and Exit Requirements

Admission. Students must (1) hold a bachelor's degree from a regionally accredited college/university; (2) have a cumulative undergraduate grade point average of 2.80; (3) take and receive satisfactory scores on either the Graduate Record Examination (score of 900 combined on verbal and quantitative with a minimum of 400 verbal for regular admission) or Miller Analogies Test (minimum score of 45 or 399 for regular admission); and (4) have an interview with the graduate program director or his/her designee. Performance in classes taken as a non-degree graduate student will not be taken into consideration in the admission process.

Continuance. Students must (1) maintain a grade point average of 3.00; (2) maintain a grade point average of 3.00 in the major

Exit. Students must (1) have a 3.00 grade point average; (2) pass a written comprehensive examination; (3) have an exit interview; (4) have completed all course requirements; and (6) submit an application for graduation;

Program Requirements

All courses in the core and elective blocks plus ECI 635/636 are offered in distributed format, via VTEL, Virtual Classroom, or asynchronously. All ID&T students are expected to have regular and reliable access to a multimedia computer (headphones, microphone, and web cam) and a high speed Internet connection.

Problem Paper Option: Area I (24 credits); Area II (6 credits); 30 credits total

Seminar Option: Area I (30 credits); Area II (6 credits); 36 credits total

Area I: Emphasis Courses (24 - 30 credits chosen from the following courses)

Skills Courses

ECI 575	Web Development for Educators	3
ECI 634	Microcomputer Hardware Systems in Education	3
ECI 648	Digital Media for Educators	3

Core Courses

IDT 617	Foundations of Instructional Technology	3
IDT 760	Cognition and Instructional Design	3
IDT 749	Instructional Systems Design	3
IDT 761	Applied Instructional Design	3

Elective Courses

IDT 647	Online Learning	3
IDT 731	Media Trends in Education	3
IDT 746	Distance Education	3
IDT 748	Instructional Technology Product Evaluation	3
IDT 752	Diffusion/Adoption of Technology Innovations	3
IDT 756	Instructional Gaming	3
IDT 773	Advance Instructional Design Tools and Techniques	3

dissertation, which will include a minimum of 12 credit hours. The dissertation will often include more than 12 credit hours depending on the length of time necessary for completion. Students entering the program may also need to complete introductory statistics courses and an instructional technology foundations course if they have not had equivalent courses or cannot demonstrate competency at a satisfactory level. Students who enter the Ph.D. program with a master's degree in an academic field that is unrelated to instructional design and technology and/or who have not completed courses to develop competency in specified areas may need to complete these courses in addition to the required courses. All courses are offered through distance learning.

All IDT students are expected to have regular and reliable access to a multimedia computer (headphones, microphone, and web cam) and a high speed Internet connection.

Under normal circumstances, admissions will be offered at least three times a year for the fall, spring, and summer semesters. Acceptance is competitive to assure that there is an adequate number of full-time faculty to serve the students through advising, mentoring, and other duties, particularly when individuals reach the dissertation stage of the program.

A minimum of two semesters of full-time study (9 credit hours per semester) is required of students in the program to meet University residency requirements. Courses taken via distance education methodologies are considered "resident" courses, so that taking three distance education courses during a semester may complete the residency requirement.

Students interested in attending full-time and applying for financial aid should submit their applications by February 1 prior to the fall semester they wish to start.

Applicants must submit completed applications and all related material no later than the following dates:

Submission Deadline	Starting Semester
July 1	Fall
November 1	Spring
March 1	Summer

*Students who are applying for financial assistance in the fall semester should submit their complete admissions application by February 1.

Program Completion and Exit. To complete the program students must fully comply with the curriculum below and all requirements noted elsewhere in the University catalog for graduate students and within the Ph.D. in Education Handbook. It is the responsibility of the student to obtain these materials and complete required portions.

Curriculum

Prerequisites: All students admitted into the Ph.D. in instructional design and technology must complete the following prerequisite courses unless they have previously completed equivalent graduate level coursework or have appropriate educational experience.

ELS 732	Statistics - Data Driven Decision Making I	3
IDT 617	Foundations of Instructional Technology	3
ID&T Introductory Courses: (6 credits)		
IDT 801	IDT Seminar	3
IDT 849	Instructional Systems Design	3
Research Core (15 credits)		
ELS 832	Statistics - Data Driven Decision Making II	3
ELS 833	Advanced Research Design and Analysis	3
ECI 890	Qualitative Research Design	3
IDT 848	Instructional Product Evaluation	3
IDT 879	Research Residency	3
Instructional Design Concentration (24 credits)		
Theory		
IDT 810	Trends and Issues in Contemporary Instructional Design*	3
IDT 846	Foundations of Distance Education	3
IDT 860	Cognition and Instructional Design*	3
IDT 863	Instructional Design Theory*	3
IDT 861	Applied Instructional Design*	3
IDT 873	Advanced Instructional Design Tools and Techniques	3
IDT 888	Internship/practicum	
Technology		
IDT 647	Online Learning	3
IDT 831	Distributed Learning Trends	3
IDT 835	Instructional Management Systems	3
IDT 852	Diffusion/Adoption of Technology Innovations	3
IDT 856	Instructional Gaming; Theory and Practice	3

* Required

Electives: Chosen from the list above, or from related areas (e.g., modeling & simulation, psychology, engineering, speech-communications, business, IO psychology)

Capstone Courses (15 credits)

ELS 881	Dissertation Seminar	3
(If seminar is waived by doctoral committee, the credits are added to the content.)		
ECI 899	Dissertation	12

Additional courses or substitutions may be used as approved by student's advisory committee.

Department of Teaching and Learning

145 Education Building
757-683-3283, 757 683-3284

Charlene Fleener, Chair

The Department of Teaching and Learning offers undergraduate and graduate programs for early childhood, elementary, middle school, and secondary school teachers, and graduate programs for reading specialists, and school library media specialists. In addition, the department has Ph.D. programs in curriculum and instruction, early childhood, and literacy leadership. Individual programs are described on the following pages.

Early Childhood Education

- o Master of Science in Education-Research Emphasis
- o Master of Science in Education, with Licensure
- o Licensure Only Early Childhood Education
- o Doctor of Philosophy in Education – Early Childhood Emphasis

PreK-6 and Middle School Programs

- o Fifth Year Master's Program for Initial Licensure Elementary (PreK-6) (Continuation of undergraduate Interdisciplinary Studies – Teacher Preparation Concentration (interdisciplinary studies programs))
- o Master of Science in Education with Initial Licensure - PreK-6
- o Master of Science in Education with Initial Licensure - Middle School (Grades 6-8)
- o Master of Science in Education for Licensed Teachers - Elementary/Middle School - General

Secondary Education Programs

- o Master of Science in Education with Initial State Licensure 6-12
- o Master of Science in Education for Licensed Teacher - Secondary 6-12

Field-Based Master's Programs

- o Field-Based Elementary/Middle School Master of Science in Education for Licensed Teachers
- o Field-Based Secondary Master of Science in Education for Licensed Teachers

Library Science – School Librarianship

- o Library Science Endorsement for licensed teachers (non-degree)
- o Master of Science in Education - Library Science K-12 Endorsement for licensed teachers
- o Master of Science in Education - Library Science K-12 Initial Licensure for non-teachers

Military Career Transition Program

- o Master of Science in Education - Initial Licensure Program (Prek-6)
- o Master of Science in Education - Initial Licensure Program - Middle School (Grades 6-8)
- o Master of Science in Education - Initial State Licensure 6-12

Reading Education

- o Endorsement – reading specialist K-12 (non-degree)
- o Master of Science in Education – Reading plus Reading Specialist Endorsement
- o Doctor of Philosophy in Education - Literacy Leadership Emphasis

Education Specialist

Curriculum and Instruction

- o Doctor of Philosophy in Education - Curriculum and Instruction Emphasis

Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in the catalog. Students are encouraged to obtain current program information from their advisors and the Darden College of Education website at <http://education.odu.edu/>.

Master of Science in Education-Research Emphasis

TBD, Graduate Program Director

Early Childhood, Research Emphasis

A master's degree in early childhood education with a research emphasis will provide educators with an advanced professional degree and qualifications beyond licensure. Course work for the degree includes a focus on scholarly research, statistical analysis, and writing for professional journals. This emphasis also will serve as the prerequisite course work to the PhD in education with a concentration in early childhood, thereby facilitating entry into the PhD program.

Admission. Admission to the graduate program in early childhood education is granted by the graduate program director in conjunction with early childhood faculty. The following requirements are necessary for admission to the program. Students must:

1. hold a baccalaureate degree from an accredited institution;
2. hold a Virginia Collegiate Professional License or an equivalent license from another state for early childhood education;
3. have an undergraduate grade point average of 2.8 or better;
4. take and receive satisfactory scores on either the Graduate Record Examination (score of 900 combined on verbal and quantitative with a minimum of 450 verbal for regular admission and 4.5 on the analytical writing section) or Miller Analogies Test (score of 498 for regular admission); and,
5. submit a 400-500 word goal statement indicating why the student wishes to enroll in the early childhood education program. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director.

Continuance. Students must:

1. maintain a grade point average of 3.00 overall, and
2. successfully complete all competencies relative to the program of study.

Exit. Students must:

1. have a grade point average of 3.00 overall and a grade of B- or better in all course work;
2. satisfactorily complete all program requirements, including the comprehensive examination;
3. complete a Graduate Student Assessment;
4. complete the Post Task Rating Form online at <http://education.odu.edu/esse/>; and
5. submit a written research project according to the program guidelines prior to the

awarding of the master's degree in education.

Program Requirements

For all students who have met the prerequisite requirement of licensure in early childhood education, the master's degree requires a minimum of 30 credits of graduate study.

Curriculum

Research Core Courses – 15 credits

ESSE 635	Research Methods in Education	3
ELS 732	Statistics Applied to Research	3
ESSE 670	Assessment and Evaluation	3
ESSE 679	Advanced Classroom Management	3
ESSE 636	Problems in Education	3

Electives – choose at least 15 credits

ECI 530	Instructional Technology in the Classroom	3
ESSE 578	Instructional Strategies PK6	3
ESSE 593	Integrating Children's Literature, Language Arts and Social Studies Across the Curriculum – PK3	3
ESSE 592	Integrating Mathematics and Science Across the Curriculum Pk3	3
ESSE 677	Advanced Child Development Theory and Research	3
ESSE 688	Practicum in Early Childhood	3-6
ESSE 690	The Child and the Family	3
ESSE 700	Social/Emotional Aspects of Child Development	3
ESSE 735	Connecting Research in Early Development to Practice in Early Childhood Education	3
ESSE 710	Models of Parent, Child, Social Interactions	3
ESSE 774	Constructivist Teaching: Theory To Practice	3

Master of Science in Education-Early Childhood Education-with Licensure in PreK-3

TBD, Graduate Program Director

This program leads to a Master of Science in Education with a concentration in early childhood education and meets Virginia's teaching licensure standards (PK-3). Accredited by the National Association for the Education of Young Children, the program for each student is designed to develop a complete understanding of the needs of children. The master's program concentrates on the teaching of young children from pre-school through third grade with an emphasis on education in public and private schools, preschools and kindergartens, as well as childcare centers. In partnership with the Child Study and Child Development Centers, students are supervised by master's level clinicians who exemplify research based practices in teaching academic and nonacademic behavior as well as the design of healthy social/emotional learning environments. Out-of school learning, including parent education and the young child's interaction with the family, also is emphasized. Students gain confidence in all aspects of teaching and instruction, child development, and insight into current trends, issues and goals of early childhood education.

Graduates of the program are licensed as PreK-3 teachers. Other graduate opportunities include: parent advocates and trainers, primary school administrators, family/school coordinators and parent educators, as well as child care administrators and directors.

Students with an undergraduate degree from a regionally accredited college or university may apply to the Master of Science in Education with PreK-3 licensure. Those individuals who have completed the undergraduate degree in interdisciplinary studies at Old Dominion University will have completed all of the necessary prerequisite coursework required by the state of Virginia and will be qualified to apply for entrance into the master's program. (Please see the College of Arts and Letters section of the catalog for baccalaureate degree requirements in interdisciplinary studies.) Students are encouraged to obtain current program information from the Early Childhood Education Program website at: <http://education.odu.edu/esse/academics/degrees/ecedeg.shtml>

Admission. Admission to the graduate program in early childhood education is granted by the graduate program director in conjunction with early childhood education faculty. Individuals entering this master's program in early childhood education must already possess a bachelor's degree in the liberal arts and sciences (or equivalent). Prerequisite course work must meet the Virginia stated competencies for PreK-3 and must fulfill the following requirements (subject to change according to Virginia Department of Education guidelines): English – 12 semester hours; Mathematics – 9 semester hours; Science – 9 semester hours; History – 6 semester hours; Social Science – 6 semester hours and Computer/technology – 3 semester hours.

The following requirements are necessary for admission to the program.

Regular admittance requires:

1. a baccalaureate degree from an institution accredited by a regional accrediting body or an equivalent degree from a foreign institution, which includes the prerequisite course work required to meet the Virginia state competencies for PreK-3 (as listed above);
2. an undergraduate grade point average of 2.80 or better;
3. a Graduate Record Examination (GRE) score of at least 900 (verbal and quantitative sections with a minimum verbal component of 450) and 4.5 on the analytical writing section OR a Miller analogies Test (MAT) minimum score of 400;
4. successful completion of the Praxis 1, SAT or ACT exam, as determined by the Virginia Department of Education; and,
5. a 400-500 word goal statement indicating why the student wishes to enroll in the early childhood education program.

Provisional admittance requires:

1. a baccalaureate degree from an institution accredited by a regional accrediting body or an equivalent degree from a foreign institution, which includes the prerequisite course work required to meet the Virginia state competencies for PreK-3 (as listed above);
2. an undergraduate grade point average of 2.80 or better;
3. a Graduate Record Examination (GRE) score of at least 800 (verbal and quantitative sections with a minimum verbal component of 400) and 4.0 on the analytical writing section OR a Miller analogies Test (MAT) minimum score of 396;
4. successful completion of the Praxis 1, SAT or ACT exam, as determined by the Virginia Department of Education; and,
5. a 400-500 word goal statement indicating why the student wishes to enroll in the early childhood education program.

Continuance. Students must:

1. maintain a grade point average of 3.00 overall;

- earn no more than two grades below B-. Students must retake courses in which grades below B- are earned and receive grades of B- or higher. Obtaining three grades below B- leads to expulsion from the program. Coursework may be repeated;
- for licensure (PK-3), successfully complete Practicum with a grade of B or better in order to be approved for student teaching; and,
- complete all prerequisite content courses with a grade of C- or better before student teaching.

Exit. Students must:

- have a grade point average of 3.00 overall and a grade of B- or better in all course work;
- successfully complete all program requirements, including undergraduate content course deficiencies, the comprehensive examination and internship/student teaching experience;
- complete a Graduate Student Assessment;
- for licensure (PK-3), successfully pass Praxis II (Elementary 0014) (scores to be determined by the Virginia Department of Education);
- successfully pass the Virginia Communication and Literacy Assessment and the Virginia Reading Assessment (as required by the Virginia Department of Education for licensure); and
- submit a professional portfolio according to program guidelines prior to the awarding of the master's degree in education with a concentration in early childhood education.

Comprehensive Examination. All students seeking a master's degree in early childhood education are required to complete successfully a written comprehensive examination. Questions will be congruent with the student's academic and professional preparation. If not passed during the first administration, a student may repeat the exam only one time. Failure to successfully pass the comprehensive examination will result in not completing the requirements for the Master of Science in Education.

Program Requirements

For all students who have the prerequisite course work, the master's degree requires a minimum of 30 semester hours of graduate study in early childhood education to complete licensure. Students are expected to demonstrate dedication to early childhood environments, professional and ethical behavior, and dispositions commensurate to that expected for teachers of young children.

Curriculum

Prerequisite Courses - 12 credits

ECI 468/568	Language Acquisition and Reading	3
ESSE 478/578	Integrating Instruction Across the Curriculum (PK-6)	3
ESSE 474/574	Foundations and Contemporary Issues in ECE	3
ECI 304	Educational Applications of Computers or	
ECI 430/530	Instructional Technology and the Classroom	3

Required Courses - 15 credits

ESSE 586	Teacher Candidate Internship for Special Endorsement	6
ESSE 677	Advanced Child Development and Research Theory	3
ESSE 679	Advanced Classroom Management w/Practicum	3
ECI 680	Reading to Learn Across the Curriculum or	
ECI 683	Diagnostic Teaching of Reading in the Classroom	3

Elective Courses - 15 credits

ESSE 492/592	Integrating Mathematics and Science Across the Curriculum PK-3	3
ESSE 493/593	Integrating Children's Literature, Language Arts and Social Studies Across the Curriculum PK-3	3
ESSE 506	Students with Diverse Learning Needs in the Gen. Ed. Classroom	3
ESSE 670	Assessment and Evaluation	3
ESSE 688	Practicum in Early Childhood Education	6
ESSE 690	The Child and the Family	3

Early Childhood Education Licensure Only

TBD, Graduate Program Director

Many students who already possess an undergraduate degree enter Old Dominion University for the sole purpose of meeting Virginia's teaching licensure standards. When these students apply for admission into an approved teacher education program, they are considered to be "licensure only" candidates and must meet the college's policy for admitting students into an approved teacher education program. Admission to Old Dominion University does not guarantee admission into degree and/or teacher preparation programs in the Darden College of Education. The PreK-3 "licensure only" option is available for those students who wish to pursue licensure and do not meet the master's degree admission requirements or who do not wish to pursue the master's degree.

Admission. Individuals entering this graduate program must already possess a bachelor's degree from a regionally accredited college/university in the liberal arts and sciences (or equivalent). Prerequisite course work must meet the Virginia stated competencies for PreK-3 and must fulfill the following requirements (subject to change according to Virginia Department of Education guidelines): English – 12 semester hours; Mathematics – 9 semester hours; Science – 9 semester hours; History – 6 semester hours; Social science – 6 semester hours; Arts and humanities – 6 semester hours; and Computer/technology – 3 semester hours.

Regular admittance requires:

- admission to Old Dominion University as a non-degree seeking graduate;
- cumulative GPA of 2.8 for all college credit courses taken in the baccalaureate degree program;
- successful completion of Praxis 1, SAT or ACT exam, as determined by the Virginia Department of Education;
- an interview and recommendation for admittance from a department representative, Teacher Education Services advisor; and,
- submission of an application for admittance into the Darden College of Education Teacher "Licensure Only" Program.

Provisional admittance requires:

- admission to Old Dominion University as a non-degree seeking graduate;
- cumulative GPA of 2.50-2.79 for all college credit courses taken in the baccalaureate degree program;
- successful completion of Praxis 1, SAT or ACT exam, as determined by the Virginia Department of Education;
- an interview and recommendation for admittance from a department representative, Teacher Education Services advisor; and,
- submission of an application for admittance into the Darden College of Education Teacher "Licensure Only" Program.

Continuance and Exit requirements are:

- successful completion of all courses required for licensure;
- maintenance of a GPA of 3.0 with a B- or better in all course work; and,
- passing scores on Praxis II (Elementary 0014), the Virginia Communication and Literacy Assessment and the Virginia Reading Assessment as required by the Virginia Department of Education for licensure. Passing scores on these examinations must be obtained prior to student teaching.
- for licensure (PreK-3), successfully complete practicum with a grade of B or better to be approved for student teaching.

Curriculum

Prerequisite Courses- 12 credits

ECI 468/568	Language Acquisition and Reading	3
ESSE 474/574	Foundations and Contemporary Issues in ECE	3
ESSE 478/578	Integrating Instruction Across the Curriculum (PK-6)	3
ECI 430/530	Instructional Technology and the Classroom	3

Required Courses - 15 credits

ESSE 586	Teacher Candidate Internship for Special Endorsement	6
ESSE 677	Advanced Child Development Theory and Research	3
ESSE 679	Advanced Classroom Management w/Practicum	3
ECI 680	Reading to Learn Across the Curriculum or	
ECI 683	Diagnostic Teaching of Reading in the Classroom	3

*Note: No transfer credits will be accepted into the professional core of this program.

In order for a student to move from the Licensure-Only program into the master's program in early childhood, application to the graduate program must be made before 12 semester hours of graduate work. If accepted into the program, only 12 hours would be counted toward the graduate degree.

Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in the catalog. Students are encouraged to obtain current program information from their advisors and the Darden College of Education website at <http://education.odu.edu/>.

Doctor of Philosophy in Early Childhood Education Emphasis

TBD, Graduate Program Director

The PhD in Education program with a concentration in early childhood education, through its integral partnership with the Old Dominion University Child Study and Development Centers, is unique in the Commonwealth of Virginia. The emphasis of the program is on the multidisciplinary study of cognitive, language, and social/emotional development of young children from birth to age nine. Professors and master teachers demonstrate research based teaching practices and provide supervised clinical training in the support of positive academic and nonacademic behavior.

The PhD program in Education with a concentration in early childhood education will prepare students to become faculty members in colleges and universities and senior administrators in institutions and agencies. Personalized mentorship and professional training are provided for those who desire careers in academic research, child advocacy, program design and evaluation, and higher education, including teacher preparation, policy, and administrative leadership. Graduates will be in high demand to assume intellectual leadership in a variety of professional settings and to provide service to schools, governmental and non governmental agencies, child care providers and families involved in the education, welfare, and the healthy development of children.

Students in this program of study will be expected to develop professional abilities in the field of early childhood education through publication, research, and service that include program support and development, teacher supervision and mentoring, advocacy activities, grant writing, and professional presentations. Involvement in faculty-sponsored research and professional development activities will be an essential part of graduate training in this concentration.

Admission. Criteria for admission to the PhD in Education will include:

1. a completed master's degree in an appropriate discipline from a regionally accredited university;
2. a minimum GPA of 3.5 (on a 4.0 scale) overall for the master's degree and in the major area of study in the master's degree;
3. a minimum of 1000 overall total score on the GRE and a minimum of 500 on both the verbal and quantitative sections of the GRE. Prospective students must score a minimum of 4.5 on the analytical writing portion of the GRE. GRE scores expire after five years; however, candidates who have completed the exam prior to five years before the application deadline may submit those scores for consideration if the scores meet the minimum expectations and they are provided from an official source such as a transcript or form provided by the Educational Testing Service. Old Dominion University reserves the right to determine what is an "official source." While these scores are minimums, other portions of the total application package will be strongly considered to balance lower scores;
4. applicants whose native language is not English must submit a current score for the Test of English as a Foreign Language (TOEFL) of at least 600;
5. applicants must submit a 500-800 word statement of their academic and professional goals with an emphasis on how the PhD degree will contribute to the achievement of the stated goals;
6. three letters of reference from sources capable of commenting on the applicant's readiness for advanced graduate study. At least two of these letters must be from graduate instructors in a college or university;
7. an interview with the early childhood education program committee. This committee also will review applications for admission; and,
8. prior course work is assumed in statistics, early childhood education and child development. If this assumption is not met, then additional course work will be added to the candidate's graduate program of study. Please see prerequisite coursework in section which follows or curriculum.

Continuance. Students must:

1. maintain a grade point average of 3.0 overall; and
2. successfully complete all requirements relative to their program of study.

Program Requirements

The PhD program in Education with a concentration in early childhood education is comprised of courses totaling a minimum of 60 academic credit hours beyond the master's degree. The curriculum includes a required core (9 credit hours), a content concentration totaling 24 credit hours, a research

component including 12 credit hours, electives (3 credit hours), the capstone course (3 credit hours), and the dissertation which will include a minimum of 12 credit hours. Students entering the program also may need to complete one introductory statistics course if they have not had such a course or cannot demonstrate competency at a satisfactory level. All students will be required to complete an internship (ESSE 888). Students who come into the PhD program with a master's degree in an academic field that is unrelated to early childhood education and/or who have not completed courses to develop competency in early childhood education may need to complete these courses in lieu of electives. A minimum of two semesters of full-time study is required of students in the program to meet University residency requirements.

Program Completion and Exit. In order to complete the program, students must comply fully with the curriculum below, all requirements noted elsewhere in the University catalog for graduate students, and within the PhD in Education Handbook. It is the responsibility of the student to obtain these materials and complete required portions.

Curriculum

Prerequisite Coursework - 12 credits. The following four courses (12 credits) are required for all students who did not have them as part of a master's degree program

ESSE 670	Assessment and Evaluation	3
ESSE 677	Advanced Child Development Theory and Research	3
ESSE 679	Advanced Classroom Management/Practicum PreK-6	3
ELS 732	Statistics Applied to Research in Education and Human Services – I	3

Required Core - 9 credits

ESSE 700/800	Social/Emotional Aspects of Child Development	3
ESSE 735/835	Connecting Research in Early Development to Practice in Early Childhood Education	3
ESSE 788/888	Internship/Practicum/Field Experience with Seminar	3-6

Research Core - 12 credits

ELS 832	Statistics Applied to Research in Education and Human Services – II	3
ELS 833	Advanced Research Design and Analysis	3
ECI 890	Qualitative Research Design	3
ECI 791/891	Program Evaluation	3

Early Childhood Concentration - 24 credits

ESSE 710/810	Models of Parent, Child, Social Interactions	3
ESSE 736/836	Working with At-Risk Children and Families	3
ESSE 737/837	Schools and Families: Enriching the Partnership	3
ESSE 739/839	Cross Cultural Perspectives in Early Childhood Education	3
ESSE 740/840	Issues in Early Childhood Language and Literacy	3
ESSE 772/872	Advanced Developmental Process	3
ESSE 774/874	Constructivist Teaching: Theory into Practice	3
ESSE 795/895	Topics in Education	3
	Electives	3 to 9 credits

With approval of the graduate program director, elective courses may be substituted for those within the early childhood concentration. Such substitutions must be approved in writing. Electives may be taken in other areas in the College of Education (e.g., special education, educational leadership, higher education, instructional design and technology) or in other colleges with the approval of the appropriate graduate program director or department.

Capstone Course - 3 credits - Required of doctoral students who have not previously identified their dissertation topic

ELS 881	Dissertation Seminar	3
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Dissertation - Minimum of 12 credits

ESSE 899	Dissertation	
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12 (min)

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Master of Science in Education – Elementary

TBD, Graduate Program Director

General Description of PreK-6 and Middle School Programs

Within the Master of Science in Education degree program in elementary education, there are a number of programs for both licensed teachers as well as those seeking initial licensure in PreK-6 and middle school 6-8.

Fifth Year Master of Science in Education for Initial Licensure Elementary (PreK-6) (Continuation of undergraduate Interdisciplinary Studies – Teacher Preparation Concentration from ODU)

This program is designed for prospective teachers who have completed the undergraduate program in teacher education (PreK-6) offered by the Department of Interdisciplinary Studies in the College of Arts and Letters.

Admission, Continuance, and Exit Requirements

Admission: For admission to the graduate portion of this program, students must:

2. have a Bachelor of Science degree through the College of Arts and Letters in interdisciplinary studies, teacher education (PreK-6) track;
3. have a cumulative grade point average of at least 2.8;
4. have been admitted to undergraduate teacher education with passing scores on Praxis I or approved SAT/ACT scores as established by the Commonwealth of Virginia;
5. take and receive satisfactory scores on either the Graduate Record Examination (score of 900 combined on verbal and quantitative with a minimum of 400 verbal for regular admission) or the Miller Analogies Test (minimum score of 45 or 399 for regular admission); and,
6. submit an application for graduate studies.

Continuance. Students must:

1. maintain a grade point average of 3.00;
2. maintain a grade point average of 3.00 in the concentration;
3. pass the Praxis II and receive a B or better in ESSE 679 prior to teacher internship; and
4. obtain passing scores on the Virginia Reading Assessment prior to internship/student teaching.

All methodology courses must be completed before a student takes ECI 668.

Exit. Students must:

1. have a 3.00 grade point average in all course requirements of the fifth year;
2. pass a written comprehensive examination;
3. successfully complete internship/student teaching;
4. have an exit interview with the graduate program director or his/her designee;
5. have completed all course requirements;
6. submit an application for graduation; and
7. pass the Virginia Communication and Literacy Assessment (VCLA) prior to licensure, and
8. successfully complete a portfolio review.

Graduate Semester I

ESSE 506	Students with Diverse Learning Needs in the Gen. Ed. Classroom	3
LIBS 642	Children’s Literature across the Curriculum, PK-8	3
ESSE 690	Child and Family	3
ESSE 677	Advanced Child Theory & Research	3

Graduate Semester II

ESSE 679	Advanced Classroom Management and Practicum in PreK-6	3
	Prerequisite: ECI 436/536	
ECI 619	Classroom Research and Assessment in C & I or Reading to Learn Across the Curriculum	3
ECI 680	Practicum Seminar in Education	3

Graduate Semester III

ECI 668	Internship/student teaching	9
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Master of Science in Education with Initial Licensure - PreK-6

This licensure/master’s program in elementary school education (PreK-6) is designed for individuals with a non-teaching B.S. or B. A. degree who want to obtain licensure as a teacher in preschool through grade six and earn a master’s degree at the same time.

Admission, Continuance, and Exit Requirements

Admission. Students must:

1. hold a bachelor’s degree from a regionally accredited college/university;
2. achieve passing scores (as established by the Commonwealth of Virginia) on the Praxis I Academic Skills Assessment or the SAT/ACT;
3. have a cumulative undergraduate grade point average of 2.80;
4. take and receive satisfactory scores on either the Graduate Record Examination (score of 900 combined on verbal and quantitative with a minimum of 400 verbal for regular admission) or Miller Analogies Test (minimum score of 45 or 399 for regular admission); and,
5. have an interview with the graduate program director or his/her designee.

Performance in classes taken as a non-degree graduate student will not be taken into consideration in the admission process. No courses in the undergraduate academic major or professional education in which the student has made below a C- will be accepted for licensure in the Darden College of Education.

Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for elementary/middle education.

Continuance. Students must:

1. maintain a grade point average of 3.00,
2. maintain a grade point average of 3.00 in the concentration;
3. pass Praxis II and receive a B or better in ESSE 679 prior to teacher internship; and,
4. obtain passing scores on the Virginia Reading Assessment prior to internship/student teaching.

All methodology courses must be completed before a student takes ECI 668.

Exit. Students must (1) have a 3.00 grade point average; (2) pass a written comprehensive examination; (3) successfully complete internship/student teaching; (4) have an exit interview; (5) have completed all course requirements; (6) submit an application for graduation; (7) pass the Virginia Communication and Literacy Assessment (VCLA) prior to licensure; and (8) successfully complete a portfolio review. No courses in the undergraduate academic major in which the student has made below a C- will be accepted toward licensure in the College of Education.

Program Requirements

Prerequisites. Individuals entering this graduate program must already possess a bachelor’s degree with classes which satisfy the Commonwealth of Virginia requirements for PreK-6 in the liberal arts and sciences and must pass the professional teacher’s assessment requirement (currently Praxis I or approved SAT/ACT scores) prescribed by the Virginia Board of Education. Liberal arts and sciences course work must fulfill the following requirements. No courses in the academic major or professional education in which the student has made below a C- will be accepted toward licensure requirements in the College of Education.

English	12	
(must include composition, oral communication, and literature):		
Mathematics:	12	
Science (including a laboratory course) :	12	
History (must include American history and world history):	9	
Social science (must include geography and economics):	6	
Arts and humanities:	6	
Computer/technology: (satisfied by ECI 430/530)	3	
Transcripts will be evaluated by the education advisor to determine whether these academic requirements have been met by previous course work. Experiential learning credit may be available for non-academic work.		
Prerequisite Undergraduate Professional Education Classes:	12	
ECI 301	Foundations of Education and Instructional Assessment	3
ECI 430/530	Instructional Technology in the Classroom PK-12	3

ESSE 406/506	Students with Diverse Learning Needs in the Gen. Ed. Classroom	3
ECI 468/568	Language Acquisition and Reading for Students with Diverse Learning Needs	3
Graduate I - Graduate Classes: 44 credits		
ESSE 513	Fundamentals of Human Growth & Development	3
ECI 532	Developing Instructional Strategies PreK-6: Language Arts	3
ECI 533	Developing Instructional Strategies PreK-6: Mathematics	3
LIBS 642	Children's Literature across the Curriculum	3
ECI 680	Reading to Learn Across the Curriculum	3
Graduate II		
ECI 534	Developing Instructional Strategies PreK-6: Science	3
ECI 535	Developing Instructional Strategies PreK-6: Social Studies	3
ECI 536	Classroom Management and Practice (passing Praxis I or SAT/ACT scores required for enrollment)	3
ESSE 690	Child and Family	3
Graduate III		
ECI 619	Classroom Research and Assessment	3
ESSE 677	Advanced Child Theory	3
ESSE 679	Adv Classroom Management and Practicum in PreK-6 (passing Praxis I scores or equivalent SAT or ACT scores required for enrollment. Prerequisite: ECI 436/536)	3
Final Semester		
ECI 668	Internship/student teaching	9
Taken only after all education classes have been completed		

Master of Science in Education with Initial Licensure – Middle School (Grades 6-8)

This licensure/master's program in middle school education (grades 6-8) is designed for prospective teachers wanting to obtain initial middle school teaching licensure and a master's degree at the same time. Open to students who have a non-teaching B.S. or B.A. degree, the program requires students to take courses that meet the Commonwealth of Virginia's stated academic competency requirements and leads to two undergraduate endorsement areas selected from the following: mathematics (21 credits minimum), English (21 credits minimum), science (21 credits minimum), or social studies (21 credits minimum). An additional 33 credits of education courses are taken at the graduate level. Advisors in the Office of Teacher Education Services will evaluate an individual's undergraduate transcript to determine which, if any, undergraduate academic content courses are needed to meet state requirements for licensure. No courses in the academic major or professional education classes in which the student has made below a C- will be accepted toward licensure in the Darden College of Education.

Admission, Continuance, and Exit Requirements

Admission. Students must:

- hold a bachelor's degree from a regionally accredited college/university in the liberal arts and sciences (or equivalent) including a minimum of 21 semester hours (which meet Virginia's stated coursework competencies) in two areas of concentration (English, mathematics, science, and history/social science) which will be listed on the license;
- achieve passing scores (as established by the Commonwealth of Virginia) on the Praxis I Academic Skills Assessment or approved SAT/ACT scores;
- have a cumulative grade point average of 2.80;
- take and receive satisfactory scores on either the Graduate Record Examination (score of 900 combined on verbal and quantitative with a minimum of 400 verbal for regular admission) or Miller Analogies Test (minimum score of 45 or 399 for regular admission);
- have an interview with the graduate program director or his/her designee; and,
- submit an application for graduate studies.

Performance in classes taken as a non-degree student will not be taken into consideration in the admission process. No courses in the academic major or

professional education in which the student has made below a C- will be accepted for admission in the Darden College of Education.

Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for elementary/middle education.

Continuance. Students must (1) maintain a grade point average of 3.00, (2) maintain a grade point average of 3.00 in the major, and (3) pass Praxis II and receive a B or better in all practicum coursework (ECI 615 and ECI 551, 553, 554, or 555) prior to teacher internship (passing scores must be attached to the teacher internship application). All methodology courses must be completed before a student takes internship/student teaching.

Exit. Students must (1) have a 3.00 grade point average; (2) pass a written comprehensive examination; (3) successfully complete internship/student teaching; (4) have an exit interview; (5) have completed all course requirements; (6) submit an application for graduation; (7) pass the Virginia Communication and Literacy Assessment (VCLA) prior to licensure; and (8) successfully complete a portfolio review. No courses in the academic major or professional education in which the student has made below a C- will be accepted toward licensure requirements in the Darden College of Education.

Program Requirements

Students seeking initial licensure plus a master's degree in middle school education (grades 6-8) must meet the academic concentration requirements in two of the following specialties and the general academic concentration requirements in the other two with a minimum grade of a C-. Transcripts will be evaluated by the education advisor to determine whether these academic requirements have been met by previous course work. Experiential learning credit may be available for non-academic work.

English

English concentration [must include coursework in language (e.g., history, structure, grammar); literature; advanced composition; and interpersonal communication or speech]: 21 semester hours.

Individuals seeking endorsement in middle education 6-8 without an English concentration must have completed 12 semester hours in English.

Mathematics

Mathematics concentration (must include course work in algebra, geometry, probability and statistics, and applications of mathematics): 21 semester hours.

Individuals seeking endorsement in middle education 6-8 without a mathematics concentration must have completed a minimum of six semester hours in mathematics.

Science

Science concentration (must include courses in each of the following: biology, chemistry, physics, and earth and space science; a laboratory course is required in two of the four areas): 21 semester hours.

Individuals seeking endorsement in middle education 6-8 without a science concentration must have completed a minimum of six semester hours in science for a total of 15 semester hours in mathematics and science.

History/Social Science

History/social science concentration (must include American history, world history, economics, geography, international affairs, and current events): 21 semester hours.

Individuals seeking endorsement in middle education 6-8 without a history/social science concentration must have completed a minimum of six semester hours in history and a minimum of six semester hours in social science for a total of 15 semester hours in history and social science.

Prerequisite Classes: 12 credits [Some may be satisfied as part of undergraduate degree]

ECI 301	Foundations of Education and Instructional Assessment.	3
ECI 430/530	Instructional Technology in the Classroom PK-12	3
ESSE 413/513	Fundamentals of Human Growth & Development	3
ECI 468/568	Language Acquisition and Reading for Students with Diverse Learning Needs	3

Graduate Professional Education [33 graduate credits]

Graduate I		
ESSE 506	Special Needs Student in the	

	General Education Classroom	3
	Two of the following to correspond with two areas of academic concentration (4 credits each)	8
ECI 551	Developing Instructional Strategies for Teaching in the Middle/High School: English	
ECI 553	Developing Instructional Strategies for Teaching in the Middle/High School: Mathematics	
ECI 554	Developing Instructional Strategies for Teaching in the Middle/High School: Science	
ECI 555	Developing Instructional Strategies for Teaching in the Middle/High School: Social Studies	
Graduate II		
ECI 615	Teaching in the Middle School	4
ECI 619	Classroom Research and Assessment	3
LIBS 642	Children's Literature across the Curriculum	3
ECI 680	Reading to Learn Across the Curriculum	3
Graduate III		
ECI 666	Internship/Student Teaching and Seminar	9

Master of Science in Education for Licensed Teachers - Elementary/Middle School - General

The following program is for licensed teachers who wish to enter a degree program leading to the Master of Science in Education degree. Non-degree students intending to enter this graduate program must meet with the elementary/middle school graduate program director upon completion of no more than six graduate credits.

The graduate program associated with this major is intended to meet the needs of the individual student. Program options are designed to accomplish three primary goals: (1) to enhance classroom instruction by enriching the knowledge and skills of practicing teachers; (2) to train and encourage classroom teachers to conduct in-school research so that significant findings in the learning-teaching process can be applied to the classroom situation; and (3) to permit teachers to upgrade their teaching credentials to the Postgraduate Professional License level.

Curricula for the program include specific courses in teaching in most of the major content areas: mathematics, science, social studies, and language arts. Each individualized program has three component areas: (1) core, (2) support; and (3) research. The research component may have up to three options (thesis, problem paper, or seminar) as indicated.

Admission, Continuance, and Exit Requirements

Admission. Students must (1) hold a bachelor's degree from a regionally accredited college/university; (2) hold at least the Virginia Collegiate Professional License or an equivalent license from another state for elementary or middle school education; (3) have a general undergraduate grade point average of at least 2.80; (4) take and receive satisfactory scores on either the Graduate Record Examination (score of 900 combined on verbal and quantitative with a minimum of 400 verbal for regular admission) or Miller Analogies Test (minimum score of 45 or 399 for regular admission); (5) have an interview with the graduate program director; and (6) apply for admission to graduate school. Performance in classes taken as a non-degree student will not be taken into consideration in the admission process. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for elementary/middle education.

Continuance. Students must (1) maintain a grade point average of 3.00 and (2) maintain a grade point average of 3.00 in the major.

Exit. Students must (1) have a 3.00 grade point average; (2) have a 3.00 grade point average in the major; (3) pass a written comprehensive examination; (4) have an exit interview; (5) have completed all course requirements; and (6) submit an application for graduation.

Program Requirements

Since students are expected to be dedicated to the goal of becoming master teachers, evidence that a student has reached this goal must be presented before graduation is certified. A minimum of 31 semester credits of course work is required for programs in elementary/middle school education. After admission to provisional or regular degree status, or before the completion of six credits as a non-degree student, the student must meet with the graduate program director who will assign a permanent advisor from the graduate faculty of the Darden College of Education. It is the responsibility of the student to confer with the assigned advisor for the purpose of developing a program of study. Each program has a core, support and research area that may, in some instances, be tailored to fit individual needs. Listed below is a possible program of study.

Program: Elementary/Middle School for licensed teachers—General Core: (12 credits)

ECI 430/530	Instructional Technology in the Classroom PK-12	3
Taken within five years or waived through examination		
ECI 683	Diagnostic Teaching of Reading	3
Instructional Strategies classes or other courses based on teaching specialties		
Support beyond the core: (6 to 12 credits)		
Classes to be selected in consultation with the student's advisor or program director		
Research courses (7 to 13 credits)		
a.	Thesis option (9-12 credits; 34 credits required for graduation)	
ECI 635	Research Methods In Education	3
ECI 698	Thesis	3-6
ELS 732	Statistics Applied to Research in Education	3
b.	Problem paper option (6 credits; 30 credits required for graduation)	
ECI 635	Research Methods In Education	3
ECI 636	Problems in Education	3
c.	Seminar option (12 credits; 36 credits required for graduation)	
ECI 635	Research Methods In Education	3
ECI 639	Seminar in Education	3
Electives		6

Master of Science in Education – Secondary

149 Education Building
757-683-5545

Robert Lucking, Graduate Program Director

General Description of Secondary Education

Within the Master of Science in Education-Secondary degree program, there are a number of programs for both licensed teachers as well as those seeking initial licensure in grades 6-12. In addition, at the undergraduate level, there are programs for initial licensure in grades 6-12.

Master of Science in Education with Initial State Licensure 6-12

There are a number of individuals who have earned B.S. or B.A. degrees who now want to obtain a master's degree leading to licensure as a secondary school teacher. In the program, students complete (or have completed) a minimum of 32 credits of undergraduate courses in one endorsement area (mathematics, social studies, English, earth science, chemistry, biology, or physics) and an additional 31-34 credits of education courses at the graduate level.

The graduate education component provides preparation in social and cultural foundations of education, adolescent development, classroom management, reading in the content area, microcomputers and curriculum, instructional strategies for secondary school, special needs students, research in curriculum and instruction, and a 14-week internship/student teaching experience. Courses include ESSE 506, 513, ECI 530, 608, 619, 640, 669, 680 and one instructional strategies course chosen from ECI 551 (English), 553 (Math), 554 (Science), 555 (Social Studies).

For the subject specialty, academic course requirements must be met in one of the following endorsement areas: mathematics, social studies, English, English as a second language, earth science, chemistry, biology, or physics.

Admission, Continuance, and Exit Requirements

Admission. Students must (1) hold a bachelor's degree from a regionally accredited college/university; (2) achieve passing scores (as established by the Commonwealth of Virginia) on the Praxis I Academic Skills Assessment or Board-approved SAT/ACT scores; (3) have a cumulative grade point average of 2.80; (4) take and receive satisfactory scores on either the Graduate Record Examination (score of 900 combined on verbal and quantitative for regular admission) or Miller Analogies Test (minimum score of 45 or 399 for regular admission); (5) have an interview with the graduate program director; and (6) submit an application for graduate studies. Performance in classes taken as a non-degree student will not be taken into consideration in the admission process. No courses in the academic major or professional education in which the student has made below a C- will be accepted for licensure in the Darden College of Education.

Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a

provisional basis subject to conditions specified by the graduate program director for secondary education.

Continuance. Students must (1) maintain a grade point average of 3.00; (2) maintain a grade point average of 3.00 in the major; (3) receive a B or better in practicum to participate in teacher internship; and (4) pass Praxis II prior to the teacher internship. Passing scores must be attached to the teacher internship application.

Exit. Students must (1) have a 3.00 grade point average; (2) pass a written comprehensive examination; (3) have an exit interview; (4) have completed all course requirements; (5) submit an application for graduation, and (6) pass the Virginia Communication and Literacy Assessment (VCLA) prior to licensure. No courses in the academic major or professional education in which the student has made below a C- will be accepted for licensure requirements in the Darden College of Education.

Graduate Professional Education Classes

ESSE 506	Students with Diverse Learning needs in the General Education Classroom	3
ESSE 513	Fundamentals of Human Growth and Development	3
ECI 430/530	Instructional Technology in the Classroom PK-12	3
ECI 608	Philosophical Foundations of Education	3
ECI 619	Classroom Research and Assessment in Curriculum and Instruction	3
ECI 640	The Management of Learning and Instruction	3
ECI 669	Internship/Student Teaching	3-9
ECI680	Reading to Learn Across the Curriculum	3
One instructional strategies course corresponding to the content specialty chosen from for following:		
ECI 551	Developing Instructional Strategies for Teaching in the Middle/HS: English	3
ECI 553	Developing Instructional Strategies for Teaching in the Middle/HS: Mathematics	3
ECI 554	Developing Instructional Strategies for Teaching in the Middle/HS: Science	3
ECI 555	Developing Instructional Strategies for Teaching in the Middle/HS: Social Studies	3

Master of Science in Education for Licensed Teachers – Secondary 6-12

The graduate programs in secondary education are designed for licensed teachers to improve and update professional competency in teaching at the secondary level. Licensed teachers completing the program enhance their ability to teach effectively and to participate in educational research in their schools. Completion of requirements leads to upgrading of the teaching license to the Postgraduate Professional level. Library endorsement for licensed teachers may be obtained in this program (See separate listing.) Non-degree students intending to enter this graduate program must meet with the secondary education graduate program director upon completion of no more than six graduate credits.

Program: General for Licensed Teachers

The general secondary education major for licensed teachers includes interest areas in computer applications in education, instructional design and technology, general vocational education, and library science/media. The program in school librarianship is listed in a separate section below. Other programs may be individually designed as students' needs indicate.

Admission, Continuance, and Exit Requirements

Admission. Students must (1) hold a bachelor's degree from a regionally accredited college/university; (2) hold the Virginia Collegiate Professional License or an equivalent license from another state preferably in secondary education; (3) have a cumulative grade point average of 2.80; (4) achieve a satisfactory score on the Graduate Record Examination (score of 900 combined on verbal and quantitative for regular admission) or Miller Analogies Test (minimum score of 45 or 399 for regular admission); (5) have an interview with faculty in the program; and (6) submit an application for admission. Performance in classes taken as a non-degree student will not be taken into consideration in the admission process. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for secondary education.

Continuance. Students must (1) maintain a grade point average of 3.00 and (2) maintain a grade point average of 3.00 in the major.

Exit. Students must (1) have a 3.00 grade point average; (2) have a 3.00 grade point average in the major; (3) pass a written comprehensive examination; (4) have an exit interview; (5) have completed all course requirements; and (6) apply for graduation.

Program Requirements

Students enrolled in secondary and general secondary programs are expected to be dedicated to the goal of becoming master classroom teachers or librarians; therefore, evidence that a student has reached this goal must be presented before graduation is certified. A minimum of 31 semester credits is required for completion of any program planned. If a graduate student elects to add other goals to the program, such as becoming a secondary education supervisor, then the program may require an additional nine to 12 credits beyond the 31-hour minimum.

Emphasis Areas

In the secondary school - general program, emphases are offered in biology, chemistry, English, mathematics, economics, history, and social studies education. For requirements in the music education interest area, refer to the Music section in the College of Arts and Letters. For library science/media refer to the separate section listed later in the department.

Area I: Core: 12 to 18 credits.

Area II: Support: 12 to 18 credits.

Area III: Research: 6 to 12 credits. Students must select one of the following options as a means of fulfilling the degree requirements: (1) a thesis option, which requires a minimum of 33 semester credits, (2) a problems paper option, which requires a minimum of 30 semester credits, or (3) a seminar option, which requires a minimum of 36 credits. Listed below are the core requirements for each option:

Thesis option

ECI 635	Research Methods In Education	3
ECI 698	Thesis	3-6
ELS 732	Statistics Applied to Research in Education	3

Problem paper option

ECI 635	Research Methods In Education	3
ECI 636	Problems in Education	3

Seminar option

ECI 635	Research Methods In Education	3
ECI 639	Seminar in Education	3
Electives		6

After admission to provisional or regular degree status, each student is assigned a permanent advisor from the Darden College of Education's graduate faculty. It is the student's responsibility to confer with the assigned advisor. The advisor will be well acquainted with the emphasis area the student has chosen and will be responsible for helping the student develop a program of study that best meets the student's needs. This proposed program of study becomes the student's graduate program upon approval of the graduate program director, and can be changed only with the advice and consent of both the faculty advisor and the student. Because of the individualized nature of graduate programs in secondary education, good working relationships between faculty advisors and students are essential.

Graduate programs in the vocational secondary education major are administered by the Departments of Educational Curriculum and Instruction and Occupational and Technical Studies.

Master of Science in Education- Secondary-Teaching English as a Second Language

149 Education Building
757-683-5545

Robert Lucking, Graduate Program Director

The Masters of Science in Education-Secondary- Teaching English as a Second Language (TESOL) concentration is for individuals who hold an undergraduate degree and wish to earn a masters in science and qualify for a Virginia Teaching license for grades PREK-12 in English as a Second Language. The program emphasis is Teaching English to speakers of other languages.

Admission, Continuance, and Exit Requirements

Admission. Students must (1) hold a bachelor's degree from a regionally accredited college/university; (2) achieve passing scores (as

established by the Commonwealth of Virginia) on the Praxis I Academic Skills Assessment or Board-approved SAT/ACT scores; (3) have a cumulative grade point average of 2.80; (4) take and receive satisfactory scores on either the Graduate Record Examination (score of 900 combined on verbal and quantitative for regular admission) or Miller Analogies Test (minimum score of 45 or 399 for regular admission); (5) have an interview with the graduate program director; and (6) submit an application for graduate studies. Performance in classes taken as a non-degree student will not be taken into consideration in the admission process. No courses in the academic major or professional education in which the student has made below a C- will be accepted for licensure in the Darden College of Education. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director.

Continuance. Students must (1) maintain a grade point average of 3.00; (2) maintain a grade point average of 3.00 in the major; (3) receive a B or better in practicum to participate in teacher internship; (4) pass the Virginia Communication and Literacy Assessment (VCLA) and (5) pass Praxis II prior to the teacher internship. Passing scores must be attached to the teacher internship application.

Exit. Students must (1) have a 3.00 grade point average; (2) pass a written comprehensive examination; (3) have an exit interview; (4) have completed all course requirements; (5) submit an application for graduation, and (6) submit the application for initial licensure.

Program Requirements

Prerequisite courses:

ESSE 313 Human Growth and Development	3
Foreign Language (two courses in sequence)	6*
*Or, 6 credits of English for foreign speakers	

Professional Education Courses:

ECI 608	Foundations of Education & Assessment	3
ECI 530	Instructional Technology in the Classroom Pk-12	3
ECI 640	Management of Learning and Instruction	3
ECI 683	Diagnostic Teaching of Reading	3
ECI 686	Language Development and Reading	3
ECI 635	Research Methods in Education	3

One of the following two options:

ECI 636	Problems in Education	
Or		
ECI 637	Contemporary Issues in Reading Research	3
ECI 669	Teacher Candidate Internship	9

Academic Content Courses:

ENGL 670	Methods and Materials in TESOL	3
ENGL 677	Cross Cultural Communication	3
ENGL 540	Linguistics	3
ENGL 679	First and Second Language Acquisition	3

Field-Based Master's Programs

Master of Science in Education – Elementary

Master of Science in Education – Secondary

149 Education Building
757-683-5545

Robert Lucking, Graduate Program Director

General Description of Field-Based Master's Programs

The field-based graduate program in the Department of Educational Curriculum and Instruction is a variation of the ECI Department's approved master's degree programs and offers licensed teachers and other professional educators the opportunity to earn a master's degree at one of several on-site school locations throughout the Commonwealth. Areas of specialization are in elementary/middle education or secondary education. Registration is restricted to licensed educators at the designated public or independent schools. Classes typically are held at those schools, and research and instruction is focused on each school's curriculum, student body and instructional offerings. While the

degree programs and requirements mirror on-campus programs, minor curricular variations may occur.

Library Science (School Librarianship K-12)

Master of Science in Education – Elementary

Master of Science in Education – Secondary

250-8 Educational Building
757-683-3222

Carol Doll, Graduate Program Director

General Description of the School Library Program

Contained within this program are the library science endorsement for licensed teachers (non-degree), a Master of Science in Education leading to endorsement in school library media K-12 for licensed teachers, and a Master of Science in Education with initial licensure in library science K-12 for non-teachers.

Library Science Endorsement K-12 for Licensed Teachers (non-degree)

This non-degree graduate endorsement program leads to licensure as a school librarian (K-12) for individuals who already have a current Virginia teaching license. Students applying to this program complete a licensure-only application form.

Admission, Continuance, and Exit Requirements

Admission. Students must (1) hold a bachelor's degree from an accredited institution; (2) have at least a collegiate professional teaching certificate from the Commonwealth of Virginia, (3) have a cumulative GPA of 2.75 for all college credit courses taken in the baccalaureate degree program, (4) have an interview and recommendation by a departmental representative in library science or his/her designee, and (5) submit an application for licensure only studies. No courses in the academic major or professional education in which the student has made below a C- will be accepted for licensure in the Darden College of Education.

Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the program director for library science.

Continuance. Students must maintain a grade point average of 3.00.

Exit. Students must (1) have a 3.00 grade point average; (2) have an exit interview; (3) have completed all course requirements; and (4) have successfully completed a portfolio review.

Required courses:

LIBS 602	Production of Instructional Materials (Technology prerequisite)	3
LIBS 605	Selection and Utilization of Nonbook Media (Technology prerequisite)	3
LIBS 675	Administration, Mgt & Evaluation of Libraries (Required first course)	3
LIBS 676	Library Media Services and the Curriculum	3
LIBS 677	Technical Services in Libraries	3
LIBS 678	Selection, Evaluation and Utilization of Materials NK-12 (Prerequisite: LIBS 642 or equivalent)	4
LIBS 679	Theory and Management of Reference and Information Retrieval	3
ECI 586	Student teaching for Special Endorsement (Taken after the completion of all library courses)	3

Master of Science in Education - Library Science K-12 Endorsement for licensed teachers

This program leads to a master's degree plus licensure as a school librarian (K-12) for individuals who already have licensure as a teacher. Students applying to this program may apply for a degree in either elementary or secondary education and should designate the library science concentration on the application form.

Admission, Continuance, and Exit Requirements

Admission. Students must (1) hold a bachelor's degree from a regionally accredited college/university; (2) hold the Virginia Collegiate Professional License or an equivalent license from another state; (3) have a general undergraduate grade point average of at least 2.80; (4) take and receive satisfactory scores on either the Graduate Record Examination (score of 900 combined on verbal and quantitative with a minimum of 400 verbal for regular admission) or Miller Analogies Test (minimum score of 45 or 399 for regular admission); (5) have an interview with the graduate program director; and (6) apply for admission to graduate school. Performance in classes taken as a non-degree student will not be taken into consideration in the admission process. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for elementary/middle education or the graduate program director for secondary education.

Continuance. Students must (1) maintain a grade point average of 3.00 and (2) maintain a grade point average of 3.00 in the major.

Exit. Students must (1) have a 3.00 grade point average; (2) have a 3.00 grade point average in the major; (3) pass a written comprehensive examination; (4) have an exit interview; (5) have completed all course requirements; and (6) submit an application for graduation; and (7) have successfully completed a portfolio review.

Program Requirements

Core (28 credits)

LIBS 602	Production of Instructional Materials (Technology prerequisite)	3
LIBS 605	Selection and Utilization of Nonbook Media (Technology prerequisite)	3
LIBS 675	Administration, Mgmt and Evaluation of Libraries (Required first course)	3
LIBS 676	Library Media Services and the Curriculum	3
LIBS 677	Technical Services in Libraries	3
LIBS 678	Selection, Evaluation and Utilization of Materials NK-12 (Prerequisite: LIBS 642 or equivalent)	4
LIBS 679	Theory and Management of Reference and Information Retrieval	3
ECI 586	Internship/student teaching for Special Endorsement (Taken after the completion of all library courses)	3

Support (3-9 elective credits): Prerequisites for the core area may be counted as support courses if taken on the graduate level within six years of the date of graduation. These courses must be selected in consultation with the graduate program director or advisor.

Research core (6-12 credits)

Thesis option (9-12 credits; 41 credits required for graduation)

ECI 635	Research Methods In Education	3
ECI 698	Thesis	3-6
ELS 732	Statistics Applied to Research in Education	3

Problem paper option (6 credits; 37 credits required for graduation)

ECI 635	Research Methods In Education	3
ECI 636	Problems in Education	3

Master of Science in Education - Library Science K-12 Initial Licensure for non-teachers

This is an initial licensure program as a school library media specialist for people with a non-teaching B.S. or B.A. It is offered as part of the Master of Science in Education - elementary/middle education. In this program, students who do not have teacher licensure but who are seeking licensure as a school

librarian (K-12) and a master's degree in education will complete professional studies courses in addition to a prescribed set of library media courses and a research core. The minimum number of graduate credits for the program is 44 with some additional undergraduate requirements.

Admission, Continuance, Exit Requirements

Admission. Students must (1) hold a bachelor's degree from a regionally accredited college/university; (2) achieve passing scores (as established by the Commonwealth of Virginia) on the Praxis I Academic Skills Assessment or Board-approved SAT/ACT scores; (3) have a cumulative grade point average of 2.80; (4) take and receive satisfactory scores on either the Graduate Record Examination (score of 900 combined on verbal and quantitative for regular admission) or Miller Analogies Test (minimum score of 45 or 399 for regular admission); (5) have an interview with the graduate program director; and (6) submit an application for graduate studies. Performance in classes taken as a non-degree student will not be taken into consideration in the admission process. No courses in the academic major or professional education in which the student has made below a C- will be accepted for licensure in the Darden College of Education.

Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for **school librarianship**.

Continuance. Students must (1) maintain a grade point average of 3.00; (2) maintain a grade point average of 3.00 in the major; (3) receive a B or better in practicum to participate in teacher internship.

Exit. Students must (1) have a 3.00 grade point average; (2) pass a written comprehensive examination; (3) have an exit interview; (4) have completed all course requirements; (5) submit an application for graduation; and (6) pass the Virginia Communication and Literacy Assessment (VCLA) prior to licensure; and (7) have successfully completed a portfolio review. No courses in the academic major or professional education in which the student has made below a C- will be accepted for licensure requirements in the Darden College of Education.

Program of Study

Prerequisites. Individuals entering this graduate program must already possess a bachelor's degree with classes which satisfy the Commonwealth of Virginia requirements in the liberal arts and sciences, and must pass the professional teacher's assessment requirement (currently Praxis I or equivalent SAT or ACT score) prescribed by the Virginia Board of Education. Transcripts will be evaluated by the education advisor to determine whether the academic requirements have been met by previous coursework or whether additional undergraduate courses are needed to satisfy the academic content requirements of the Commonwealth of Virginia. No courses in the academic major or professional education in which the student has made below a C- will be accepted toward licensure requirements in the College of Education.

Professional Education (27 credits – some of these are undergraduate credits and/or may have been taken as an undergraduate)

ECI 301	Social and Cultural Foundations of Education	3
ECI 430/530	Instructional Technology in the Classroom PK-12	3
One of the following four instructional strategies courses:		3
ECI 432/532	Developing Instructional Strategies PreK-6: Language Arts <i>or</i>	
ECI 433/533	Developing Instructional Strategies PreK-6: Mathematics <i>or</i>	
ECI 434/534	Developing Instructional Strategies PreK-6: Science <i>or</i>	
ECI 435/535	Developing Instructional Strategies PreK-6: Social Studies	

ECI 436/536	Classroom Management and Practicum	3
ECI 586*	Internship/student teaching	9

*To be taken after the completion of all required professional education and library science courses.

ECI 680	Reading Across the Curriculum	3
ESSE 413/513	Human Growth and Development	3

Library Science (25 credits) (Taken after at least 12 credits of professional education have been completed)

LIBS 602	Production of Instructional Materials (Note: Technology prerequisite)	3
LIBS 605	Selection and Utilization of Nonbook Media (Note: Technology prerequisite)	3
LIBS 642	Children's Literature Across the Curriculum	3
LIBS 675	Administration, Management and Evaluation of Libraries (Required first course in the library science courses)	3
LIBS 676	Library Media Services and the Curriculum	3

LIBS 677	Technical Services in Libraries	3
LIBS 678	Selection, Evaluation and Utilization of Materials NK-12 (Prerequisite: LIBS 642 or equivalent)	4
LIBS 679	Theory and Management of Reference and Information Retrieval	3
Research (6 credits) Problems paper		
ECI 635	Research Methods In Education	3
ECI 636	Problems in Education	3

Military Career Transition Program

149 Education Building
757-683-5545

Robert Lucking, Graduate Program Director

General Description of the Military Career Transition Program

Designed with the needs and interests of the military person and spouse in mind, the Military Career Transition Program (MCTP) is a graduate, off campus, evening, and weekend program specifically geared towards military and Department of Defense (DoD) personnel and their spouses. Upon completion of the Master of Science in Education and additional state licensure requirements, participants are eligible for licensure in the Commonwealth of Virginia. Licensure grade levels include elementary education (PreK-6), middle school (6-8), and secondary (6-12); endorsements are available in the areas of mathematics, sciences (Earth science, biology, chemistry, and physics), English, history/social studies and technology education. Participants seeking technology education may do so in a program at the undergraduate or graduate level offered through the Department of Occupational and Technical Studies.

Potential candidates for the master's degree program must possess an undergraduate degree from a regionally accredited college/university. Military personnel must have, at a minimum, six years of military service (active, reserve, or national guard). Spouses and DoD employees must have, at a minimum, six years of full time work experience to be eligible for admission.

Degree courses are offered via distance education (web based and TELETECHNET), and traditional classroom format at locations throughout Virginia and in Bangor/Everett and Bremerton, Washington. Site personnel are available at all locations to provide advisement. All MCTP students are required to meet with their site advisor prior to registration each semester. Old Dominion University is a member of the Service Members Opportunity Colleges (SOC), recognizing the unique nature of the military lifestyle and committed to easing the transfer of relevant course credits, providing flexible academic residency requirements, and crediting learning from appropriate military training and experiences.

Programs:

- Master of Science in Education – Elementary
- Initial Licensure- Elementary (grades pk-6)
- Initial Licensure- Middle School (grades 6-8)
- Master of Science in Education – Secondary
- Initial State Licensure- Secondary (grades 6-12)

Admission. Students must: (1) hold a bachelors degree from a regionally accredited college/university; (2) achieve passing scores on Praxis I Academic Skills Assessment based on Virginia standards; (3) have served a minimum of six years of military service; spouses and DoD personnel must have six years of full time work experience; (4) provide a 500 word essay (goal statement); (5) submit a two page resume highlighting professional work experience; (6) complete an interview with an MCTP advisor; (7) receive official transcript review from MCTP main campus office. Performance in courses taken as a non-degree student will not be taken into consideration in the admission process; and (8) purchase LiveText, <http://www.livetext.com/>.

Continuance. Students must: (1) maintain a graduate grade point average of 3.00; (2) receive a satisfactory observation evaluation as part of ECI 608; (3) complete required content coursework with grades of C or better; (4) submit a teacher internship application by published deadlines; (5) complete Human Growth and Development; (6) submit passing scores on VCLA, VRA (pk-6 only), and Praxis II for subject area based on Virginia standards and transcripts verifying successful completion content coursework as part of ECI 583 requirements and for student teaching eligibility.

Exit. Students must (1) have a graduate grade point average of 3.00; (2) pass a written comprehensive exam; (3) pass teacher candidate internship; (3) submit a graduation application and complete University graduate assessment; (5) submit a Virginia application for teacher licensure with official documentation to verify completion of all program and teacher licensure requirements as outlined by the College of Education and Virginia Department of Education.

Program of study:

Block I

ECI 608*	Foundations of Education	3
ECI 616	Design for Effective Instruction	3
ESSE 517	Collaboration and Transition	3
ECI 530	Instructional Technology and the Classroom	3

Block II

ESSE 500	Foundations of Special Education	3
ECI 640	The Management of Learning and Instruction	3
ECI 680	Reading to Learn Across the Curriculum	3
Two from the following Instructional Strategies/Methods:		
ECI 656, 657, 658, 659, 662		3
Two methods courses required for Middle School (6-8)*		
ECI 568	Language Acquisition and Reading for Students with Diverse Learning Needs	3
ECI 619	Classroom Research and Assessment in Curriculum and Instruction	3
ECI 583	Practicum Seminar –Student Teaching	1

Block III

ECI 669	Internship/Student Teaching and Seminar****	6
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Total credits required for Master of Science in Education with initial licensure: pk-6 (37); 6-8 (40), 6-12 (37)

*Upon registration for ECI 608 students must request an observation placement at the following website, www.odu.edu/tes.

**Instructional strategies/methods (content area): ECI 656 (pk-6); 657 (English/language arts); 658 (mathematics); 659 (sciences-Earth science, biology, chemistry, physics), 662 (history/social studies). An observation or practicum may be required.

*** Secondary education students can choose to take an approved elective

****Blocks I and II with a graduate GPA of 3.0, content coursework, passing grade in ECI 583, passing scores on VCLA, VRA (pk-6 only), and passing scores on appropriate Praxis II for content area, must be completed and verified by Teacher Education Services and Advising Office for internship/student teaching eligibility (Block III).

Content area, co-requisite requirements specific to grade level/specialty area are mandatory for teacher licensure. An official transcript review based on the standards outlined by the Virginia Board of Education will be provided by the MCTP academic advisor to guide subject area preparation.

Master of Science in Education – Reading

168-3 Education Building
757-683-3283, 683-3284

Charlene Fleener, Graduate Program Director

General Description of Reading Education

Contained within this program are the Reading Specialist Endorsement for licensed teachers (non-degree) already having a master's degree, Master of Science in Education reading plus Reading Specialist Endorsement for licensed teachers, and the Doctor of Philosophy in literacy leadership.

Endorsement – Reading Specialist K-12 (non-degree)

This non-degree graduate endorsement program leads to licensure as a reading specialist for individuals already having a current Virginia teaching license and a master's degree. Students applying to this program complete a licensure-only application form and submit official transcripts to the reading program director. Students intending to enter this graduate program must meet with the reading education graduate program director before or upon completion of no more than six graduate credits. In addition to required coursework, students must satisfactorily complete the Virginia Reading Assessment for Reading Specialists and document three years successful

teaching experience with reading as a major portion of the teaching responsibilities to obtain the reading specialist endorsement.

Required Courses for Endorsement [30 credits]:

ECI 689	Survey of Reading Instruction	3
ECI 680	Reading to Learn Across the Curriculum	3
ECI 683	Diagnostic Teaching of Reading in the Classroom	3
ECI 685	Organizing and Supervising Reading Program Development	3
ECI 686	Advanced Language Development and Reading	3
ECI 693	Practicum in Reading	3
ECI 618	Approaches to Teaching Literature and Writing	3
ECI 620	Multicultural Children’s Literature and Literacy	3
ECI 621	Differentiated Literacy Instruction and Portfolio Dev	3
ECI 635	Research Methods in Education	3

ECI 693	Practicum in Reading	3
Area II: Research [6 credits]		
ECI 635	Research Methods in Education	3
ECI 637	Problems in Reading Education	3
Note: There is also a thesis option whereby the student omits ECI 637 and takes ECI 635 as well as ECI 698-699.		

Doctor of Philosophy in Education – Literacy Leadership Emphasis

145 Education Building
757-683-3283, 757 683-3284

Jane Hager, Graduate Program Director

The Doctor of Philosophy in Literacy Leadership is a degree with a unique focus to prepare individuals as literacy professionals for leadership and supervisory roles, teaching literacy curriculum and instruction in higher education, and/or consulting for educational organizations or private industry. With a solid grounding in assessment, evaluation, and quantitative and qualitative research, the rigorous course of study provides an opportunity for students to develop a strong background in literacy with a leadership emphasis while providing the flexibility to pursue individual interests.

Possession of this degree often provides those who have earned it with entry into business, government, research and other leadership positions. The Ph.D. in literacy leadership is intended to prepare individuals for these roles and to provide them with the skills to carry out scholarly research and add to the body of knowledge in the field. The curriculum described below contains elements that will, if completed successfully, provide research expertise, literacy leadership skills and experience, and the ability to serve the nation’s schools, colleges and universities and contribute to global education.

Admission, Continuance, and Exit Requirements

Admission. For admission to this program, individuals should have a completed master’s in Reading or another appropriate discipline from a regionally accredited university. Prospective students should also have prior course work in statistics and curriculum and instruction. If this requirement is not met, then additional course work will be added to the candidate’s graduate program of study. Please see prerequisites on the curriculum description for specifics.

Application requirements for the Ph.D. in literacy leadership are as follows:

1. A completed application form which is available online or from the Office of Graduate Admissions.
2. Official transcripts of all undergraduate and graduate courses and degrees completed.
3. Official report scores from the Graduate Record Examination (verbal, quantitative, and analytical) taken within the last five years. GRE scores expire after five years; however, candidates who have completed the exam prior to five years before the application deadline may submit those scores for consideration if they are provided from an official source such as a transcript or form provided by the Educational Testing Service. Old Dominion University reserves the right to determine what is an “official source.”
4. Applicants whose native language is not English must submit a current score for the Test of English as a Foreign Language (TOEFL) of at least 600 (written) or 250 (computer based).
5. Applicants must submit a 1500 word statement of their academic and professional goals with an emphasis on how the Ph.D. degree in literacy leadership will contribute to the achievement of the stated goals.
6. Three letters of reference from sources capable of commenting on the applicant’s readiness for advanced graduate study. It is recommended that these letters come from employment supervisors and/or university faculty members.
7. An interview with the literacy leadership program committee. This committee will also review applications for admission.

Under normal circumstances, admissions will be offered once a year in order to build efficient cohort groups for this type of advanced study. In order to enhance the experience of the students and to increase the efficiency by which courses are offered, a cohort of 10-15 students will be admitted each year. This limited number of students is necessary to assure that there is an adequate number of full-time faculty to serve the students through advising and other duties, particularly when the cohorts reach the dissertation stage of the program.

Master of Science in Education—Reading plus Reading Specialist Endorsement

The program is designed to provide professional training for prospective reading specialists, literacy coaches, and elementary- and secondary-level reading teachers.

Extensive course offerings permit the graduate student to pursue an area of interest, such as elementary school reading, secondary school reading, college reading, literacy coaching, and reading in clinical settings. As a culminating experience, each student investigates a problem area and prepares a formal research paper or project on a topic of interest.

Candidate study may include an intensive search of the professional literature on reading or selected field experiences in public, private, or governmental reading programs that provide reading services to clients. In addition, candidates tutor children and aid in the diagnosis and remediation of reading problems. Candidates who have three years of satisfactory experience in teaching reading, completed the entire degree program, and satisfactorily completed the Virginia Reading Assessment for Reading Specialists may obtain the reading specialist endorsement.

Admission, Continuance, and Exit Requirements

Admission. Students must: (1) hold a bachelor’s degree from a regionally accredited college/university; (2) hold the Virginia Collegiate Professional License or an equivalent license from another state; (3) have an undergraduate grade point average of 2.80 and an average of 3.00 in the major; (4) achieve a satisfactory score (as established by the ECI Department) on the Graduate Record Examination or the Miller Analogies Test; (5) have an interview with the graduate program director; (6) have had three semester credits in reading courses at the undergraduate level; and (7) submit an application for graduate studies. Performance in classes taken as a non-degree student will not be taken into consideration in the admission process. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for reading education.

Continuance. Students must (1) maintain a grade point average of 3.00 and (2) maintain a grade point average of 3.00 in the major.

Exit. Students must (1) have a 3.00 grade point average; (2) have a 3.00 grade point average in the major; (3) pass a written comprehensive examination; (4) have an exit interview; (5) have completed all course requirements; (6) submit an application for graduation; and (7) pass the Virginia Reading Assessment for Reading Specialists.

Program Requirements

A minimum of 33 semester credits is required for the master’s degree in reading education. The degree candidate must successfully pass a comprehensive examination, usually taken in the last semester of the program.

Course requirements for completion of the degree program are listed below.

Area I: Core [27 credits] (The following is the suggested sequence for these courses.)

ECI 689	Survey of Reading Instruction	3
ECI 683	Diagnostic Teaching of Reading in the Classroom	3
ECI 686	Advanced Language Development and Reading	3
ECI 680	Reading to Learn Across the Curriculum	3
ECI 618	Approaches to Teaching Literature and Writing	3
ECI 620	Multicultural Children’s Literature and Literacy	3
ECI 621	Differentiated Literacy Instruction and Portfolio Dev	3
ECI 685	Organizing and Supervising Reading Program Development	3

Applicants must submit completed applications and all related material no later than March 1 of each year, and students will be admitted for study beginning in June or July of the same year.

Continuance. The Ph.D. program in literacy leadership is comprised of courses totaling a minimum of 60 academic credit hours beyond the master's degree. The curriculum includes an introductory core of six credits, a content area with 24 credits, a research component including 15 credit hours, the three credit dissertation seminar and the dissertation which will include a minimum of 12 credit hours. The dissertation will often include more than 12 credit hours depending on the length of time necessary for completion.

To build a cohesive cohort group, the introductory core will be offered on the Old Dominion University campus each summer. It will be expected that all newly admitted students will come to campus for these courses during the summer after which they are admitted to the program. Residency for a second intensive set of courses the following summer is recommended but not required.

A minimum of two semesters of full-time study is required of students in the program to meet University residency requirements. One of the semesters of full-time study (defined as completion of nine credit hours in the fall and spring or six credits during the summer) must be accomplished by the completion of the intensive summer noted above. The second semester of residency can be accomplished in several ways. Students may complete nine credit hours during any spring or fall semester or may take six credits during the summer.

Program Completion and Exit. In order to complete the program students must fully comply with the curriculum below and all requirements noted elsewhere in the University catalog for graduate students and within the Ph.D. in Education Handbook. It is the responsibility of the student to obtain these materials and complete required portions.

Program of Study

Prerequisite Coursework: All students admitted into the Ph.D. in literacy leadership must complete the following prerequisite courses unless they have previously completed equivalent graduate level coursework or have appropriate educational experience.

Students must have taken ONE of the following research course (3 credit hours):

ELS 660	Teacher Candidate Internship for Special Endorsement	3
COUN 635	Research and Program Evaluation	3
ECI 635	Research Methods in Education	3
ECI 619	or Classroom Research and Assessment in Curriculum and Instruction	3
OTED 635	Introduction to Research in Education	3

Students must also have the following or an equivalent:

ELS 732	Statistics Applied to Research in Educational Leadership – Data Driven Decision Making I	3
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Introductory Core: (6 credits – Required Courses)

ECI 724/824	Readings in Contemporary Society	3
ECI 740/840	Critical Issues: Curriculum Research	3

Research Core: (15 credits - Required Courses)

ELS 832	Statistics Applied to Research in Educational Leadership–Data Driven Decision Making II	3
ELS 833	Advanced Research Design and Analysis	3
ECI 748/848	Assessment and Evaluation	3
ECI 790/890	Qualitative Research Design	3
ECI 791/891	Program Evaluation	3

Content Area Credits (24 credits)

ECI 722/822	Curriculum Seminar in Content Areas	3
ECI 726/826	Advanced Supervision of Reading Programs	3
ECI 727/827	Advanced Practicum in Reading	3
ECI 728/828	Problems and In-service in Reading/Literacy Research	3
ELS 811	Visionary Leadership for Educational Improvement	3
ELS 878	Leadership for Teaching and Learning	3
ELS 880	Curriculum Leadership	3
ELS 887	Leadership for Exceptional Needs	3

Additional ECI courses or substitutions as approved by advisor/committee and ECI Ph.D. graduate program director. With approval of the advisor/committee, a student may select up to four courses from the other education Ph.D. concentrations with no more than two courses from any one of these areas.

Dissertation

ECI 881	Dissertation Seminar (If seminar is waived by doctoral committee, the credits are added to the content.)	3
ECI 899	Dissertation	12

Education Specialist

149 Education Building
757-683-5545

Robert Lucking, Graduate Program Director

This program is designed for licensed teachers of grades PreK-12 who hold a master's degree and wish to improve their skills/knowledge in education and earn an advanced degree. Offered in cooperation with the Department of Educational Leadership and Counseling, 18 credits are taken in the area of administration. The remainder of the 33 credits consists of courses in the Department of Educational Curriculum and Instruction.

Curriculum and Instruction

TBD, Graduate Program Director

General Description of the Ph.D. in Education – Curriculum and Instruction Emphasis

The Doctor of Philosophy in curriculum and instruction is the degree most often desired by classroom teachers/SLMS who want to continue their education but remain in the classroom or school library media center, individuals who want to teach curriculum and instruction (including specialties such as library science) in higher education, and/or individuals in supervisory positions in school divisions who wish to continue their education in curriculum and instruction. With a solid grounding in assessment, evaluation, and quantitative and qualitative research, the rigorous course of study provides an opportunity for students to develop a strong background in curriculum and instruction while providing the flexibility to pursue individual interests. The curriculum described below contains elements that will, if completed successfully, provide research expertise, curriculum and instruction skills and experience, and the ability to serve the nation's schools, colleges and universities and contribute to global education.

Admission. For admission to this program, individuals should have a completed master's degree in an appropriate discipline from a regionally accredited university. Degrees that are equivalent to a master's degree such as L.L.B., J.D., and D.D.S., will be considered. Prospective students should also have prior course work in statistics, and curriculum and instruction. If this requirement is not met, then additional course work will be added to the candidate's graduate program of study. Please see prerequisites on the curriculum description for specifics.

Application requirements for the Ph.D. in curriculum and instruction are as follows:

1. A completed application form which is available online or from the Office of Graduate Admissions;
2. Official transcripts of all undergraduate and graduate courses and degrees completed;
3. Official report scores from the Graduate Record Examination (verbal, quantitative, and analytical) taken within the last five years. GRE scores expire after five years; however, candidates who have completed the exam prior to five years before the application deadline may submit those scores for consideration if they are provided from an official source such as a transcript or form provided by the Educational Testing Service. Old Dominion University reserves the right to determine what is an "official source;"
4. Applicants whose native language is not English must submit a current score for the Test of English as a Foreign Language (TOEFL) of at least 600 (written) or 250 (computer based);
5. Applicants must submit a 500 to 1,000 word statement of their academic and professional goals with an emphasis on how the Ph.D. degree in curriculum and instruction will contribute to the achievement of the stated goals;
6. Three letters of reference from sources capable of commenting on the applicant's readiness for advanced graduate study. It is recommended that these letters come from employment supervisors and/or university faculty members; and,
7. An interview with the curriculum and instruction graduate program advisor. The Curriculum and Instruction program committee will also review applications for admission.

Admission to the Ph.D. programs in the Department of Educational Curriculum and Instruction is competitive. A number of criteria are considered including graduate and undergraduate GPAs, GRE scores, writing ability, a personal interview, and the match between student interests and faculty

expertise. Meeting the minimum requirements established by the department does not ensure admission to the program. A score of 1,000 or higher on the GRE, 500 on both the verbal and quantitative sections; and a score of 4.5 or higher on the analytical writing portion of the GRE are expected (not required). A minimum undergraduate GPA of 2.8 and a minimum graduate GPA of 3.25 are recommended.

Degree Requirements. The Ph.D. program in curriculum and instruction is comprised of courses totaling a minimum of 60 academic credit hours beyond the master's degree. The curriculum includes an introductory core of six credits, a content area with 24 credits minimum, a research component including 15 credit hours, the three credit dissertation seminar and the dissertation which will include a minimum of 12 credit hours. The dissertation will often require more than 12 credit hours depending on the length of time necessary for completion. Students entering the program may also need to complete introductory research methods statistics courses if they have not had such courses or cannot demonstrate competency at a satisfactory level. Students who come into the Ph.D. program with a master's degree in an academic field that is unrelated to curriculum and instruction and/or who have not completed courses to develop competency in specified areas may need to complete these courses in addition to the required courses.

Under normal circumstances, admissions will be offered to build efficient cohort groups for this type of advanced study. In order to enhance the experience of the students and to increase the efficiency by which courses are offered, cohorts will be limited. The limited number of students assures that there is an adequate number of full-time faculty members to serve the students through advising and other duties, particularly when the cohorts reach the dissertation stage of the program.

A minimum of two semesters of full-time study is required of students in the program to meet University residency requirements. Full-time study is defined as the completion of nine credit hours in the fall and spring terms. The residency requirement can be accomplished in several ways. Students may complete nine credit hours during any spring, fall or summer semesters. Courses taken via TELETECHNET or other distance education methodologies are considered "resident" courses, so that taking three TELETECHNET courses during a semester may count toward the residency requirement.

Applicants must submit completed applications and all related material no later than March 15 of each year for summer or fall admission and no later than November 15 for spring admission. For exceptional cases, admissions may occur at other times.

Program Completion and Exit. In order to complete the program students must fully comply with the curriculum below, and all requirements noted elsewhere in the University catalog for graduate students and within the Ph.D. in Education Handbook. It is the responsibility of the student to obtain these materials and complete required portions.

Curriculum

Prerequisite Coursework: All students admitted into the Ph.D. program in curriculum and instruction must complete the following prerequisite courses unless they have previously completed equivalent graduate level coursework or have appropriate educational experience.

Students must have taken ONE of the following research courses or equivalent (3 credits):

ELS 660	Program Evaluation Research and Planning	
COUN 635	Research and Program Evaluation	
ECI 635	Research Methods in Education	
ECI 619	Classroom Research and Assessment in Curriculum and Instruction	
OTED 635	Introduction to Research in Education	

Students must also have the following or equivalent:

ELS 732	Statistics Applied to Research in Educational Leadership	3
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Content Core: (6 credits – Required courses)

ECI 724/824	Readings in Contemporary Society	3
ECI 740/840	Critical Issues: Curriculum Research	3

Research Core: (15 credits - Required Courses)

ELS 832	Statistics Applied to Research in Education	3
ELS 833	Advanced Research Design and Analysis	3
ECI 748/848	Educational Assessment and Psychometrics	3
ECI 790/890	Qualitative Research Design	3
ED 877	Program and Evaluation in Education	3

Other Content Area Credits (24 hour minimum)

ECI 701/801	Seminar in Education: Theories of Learning and Instruction	3
ECI 721/821	Advanced Curriculum Design and Development	3
ECI 722/822	Curriculum Seminar in Content Areas	3
ECI 731/831	Instructional Technology Trends in Curriculum and Instruction	3
ECI 735/835	Technology and the Management of	

	Curriculum and Instruction	3
ECI 741/841	Change Issues in Curriculum and Instruction	3
ECI 752/852	Curriculum Problems in the Urban School and Society	3
ECI 788/888	Seminar in the Multicultural Environment	3
ECI 795/895	Topics in Education	
	(Not to exceed 6 credits)	3-6

Additional ECI courses or substitutions may be approved by the advisor/committee and ECI Ph.D. graduate program director. With approval of the advisor/committee, a student may select up to four courses from any of the other education Ph.D. concentrations or from other colleges in the university with no more than two courses from any one of these areas or colleges.

Dissertation Seminar

ECI 881	Dissertation Seminar (If seminar is waived by doctoral committee, the hours are added to the content area.)	3
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Dissertation

ECI 899	Dissertation	12
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Teacher Education Services

152 Education Building
757-683-6448

Leigh Butler, Director

The staff in the Office of Teacher Education Services and Advising (TES) in the Darden College of Education supports teacher education programs in the College of Arts and Letters, the College of Science, and the Darden College of Education. In this role of support, the mission of the Office of TES is to provide, facilitate, promote, and uphold the standards of Old Dominion University to grant undergraduate and graduate degrees with a teacher education emphasis in the following areas: PreK-3, PreK-6, 6-8, 6-12, K-12, guidance and counseling, and speech-language license. The emphasis areas are accredited by the National Council for Accreditation of Teacher Education (NCATE) and approved by the Virginia Department of Education (VDOE).

The TES staff is committed to serving students pursuing either a professional education or human services emphasis through their respective college's academic departments and fostering a process with the following features:

- academic advisement of prospective teacher candidates pursuing an undergraduate or graduate degree with either a professional education or human services emphasis, including development of appropriate academic plans;
- promotion of professional education and human services programs, including informing candidates of scholarship and study abroad opportunities, as well as credentialing requirements;
- communication with prospective teacher candidates regarding admissions, continuance, and exit requirements for their respective education degree and initial licensure programs; and
- facilitation of the placement of field experiences for teacher candidates in appropriate K-12 classroom settings in order to meet observation, practicum, and student teaching internship requirements.

Early Practicum Experiences

A candidate may participate in a course with a practicum experience through one of two tracks.

- A. A candidate may be eligible to participate in the early practicum experience course if they have been admitted into an approved teacher education program. This requires that candidates pass the Praxis I exam or meet Virginia Board of Education approved cut off scores for the SAT or ACT. In addition, candidates must meet the GPA for their individual programs, professional education courses, and minimum grade requirements, along with other course prerequisites.
- B. A provisionally licensed teacher may participate in an early practicum course if they are currently employed with a school division, have a letter from the Virginia Department of Education listing the course as a needed requirement, and have passing Virginia Communication and Literacy Assessment scores (VCLA). The provisionally licensed teacher will have to meet all the requirements of the course as stated in the syllabus.

We are committed to developing candidates skilled in teaching students of all cultural and socioeconomic backgrounds. Thus, candidates must complete their early practica in a public or private school that has been accredited by the Virginia Department of Education. Thus, teacher candidates may request specific school districts and schools. However, these requests are informal and

ARE NOT guaranteed. Candidates may not contact school district personnel in order to request or obtain a placement. Candidates may not complete their practicum at a school where a relative is attending or working. Candidates are required to disclose this information on the on-line application.

Teacher Internship

The teacher internship is the culminating experience in the teacher education programs. This experience is a crucial part of a candidate's preparation to becoming a professional educator. During the teaching internship experience, candidates observe the operation of schools; analyze the implementation of curricula and instructional strategies; observe the growth and development of students; assist with classroom and extracurricular activities; and ultimately assume responsibility for the academic instruction and management of the classroom. Candidates' work is evaluated by clinical facilitators (cooperating teachers in the schools, in conjunction with University supervisors).

To be eligible to participate in the teaching internship experience, the candidate must have been admitted into an approved teacher education program. This requires that the candidate pass the Praxis I exam or meet Virginia Board of Education approved cut off scores for the SAT or ACT. In addition, candidates must meet the GPA requirements for their individual programs, professional education GPA requirements, and minimum grade requirements. Also, students must pass the Praxis II exam in their content area if one is required by the Virginia Department of Education for licensure and the Virginia Communication and Literacy Assessment (VCLA), prior to the teacher internship. Students in the PreK-3, PreK-6, and Special Education programs must pass the Virginia Reading Assessment prior to the teacher internship.

We are committed to developing candidates skilled in teaching students of all cultural and socioeconomic backgrounds. Thus, teacher candidates may complete their teaching internships in public or private schools that have been accredited by the Virginia Department of Education or other State Department of Education. Candidates may **request** specific school districts and schools. These requests are informal and are not guaranteed. Candidates may not contact school district personnel in order to request or obtain a placement. Candidate may not complete their internship at a school where a relative is attending or working. Candidates are required to disclose this information on the student teaching application. If a candidate is placed at a school where a relative is located, the candidate will be removed from the placement and will have to complete the internship the following semester.

A negative tuberculin test is required prior to the teacher internship. Prospective candidates are required to provide authorization for the release of any disciplinary action that is contained in their student records. Prior to placement, candidates may be required to complete the Virginia State Police Criminal History Check (SP230), the Child Protective Service Central Registry Release of Information (032-02-1515/1), and a fingerprint check by the school district. Candidates may be liable for all costs incurred. All candidates are required to review the Teacher Education Services website at <http://education.odu.edu/tes/pdf/backgroundcheckbydistrict.pdf> for districts requiring background checks. Additionally, prospective teacher interns should avail themselves of liability or tort insurance, which can be obtained through membership in the Student Virginia Education Association of Old Dominion University.

Programs for Research and Evaluation in Public Schools

David Blackburn, Director
137 Education Building
757-683-5449
<http://education.odu.edu/preps>
<http://ctqcl.org>

Programs for Research and Evaluation in Public Schools (PREPS) was established within the Darden College of Education in 2004 to assist school divisions within the Commonwealth of Virginia to meet the requirements of PL 107-110, the No Child Left Behind Act of 2001. Those requirements include research-based education programs, program evaluation, using data to guide and direct instruction, and developing research capacity in schools. The PREPS research staff is motivated by a desire to equip students with the necessary skills to create an identity for themselves. PREPS works with schools across the Commonwealth through its Center for Teacher Quality and Educational Leadership (CTQEL). The center offers:

- On-site professional development interventions, e.g., assessment literacy, aspiring principal preparation, equity, content, school counselor audits.

- A virtual network offering video conferencing to link schools with each other and ODU to share instructional practice, research, and training.
- Access to national resources such as American School Counselor Association to do school audits with Darden College of Education counseling faculty.
- Action research opportunities with teachers, administrators and PREPs researchers and college faculty.
- Resource development, e.g., PREPs has partnered with schools to bring in over \$15 million in grants.

The center is funded by the Virginia General Assembly and will enable Old Dominion University to continue to change the lives of students, teachers, and educational leaders.

Virginia Troops to Teachers

Joseph Wargo, Director
113 Education Building
757-683-3327, 1-800-560-4317
<http://www.odu.edu/troopstoteachers>

Troops to Teachers (TTT) was established in 1994 as a Department of Defense program and is managed by the Defense Activity for Non-Traditional Education Support (DANTES) in Pensacola, FL. Old Dominion University is the headquarters for Virginia TTT with all Commonwealth of Virginia institutions of higher learning participating in the program. The primary objective of TTT is to help recruit quality teachers for schools that serve low-income families throughout the United States. TTT helps relieve the teacher shortages, especially in math, science, special education and other high-need subject areas, and assists military personnel in making a successful transition to a second career in teaching.

TTT provides a \$5,000 stipend to assist military personnel who are (1) retired, (2) within one year of retiring with an approved retirement date, or (3) honorably discharged with six or more years of service and willing to obligate in the active reserves on a three-year contract. The stipend may be used to pay for any approved teacher licensure program in any state above the required bachelor's degree at any accredited college. The stipend may not be used for training principals, guidance counselors or ROTC instructors. TTT participants are obligated to teach for three years in a high-need school district.

Participants hired to teach in a setting where 50% or more of the students receive free or reduced lunches or their Individual Disability Education Act (IDEA) percentage is 13.5% or more are eligible for a \$10,000 bonus. Acceptance of any monies obligates the Troops to Teachers participant to teach for three years in a poverty-level school.

Virginia Department of Education Career Switcher Program

122 Education Building
757-683-4686, 1-800-262-0009
www.odu.edu/careerswitcher
Fran Puchalski, Co-Director
Lisa Temple, Co-Director

The Old Dominion University Programs for Continued Learning has offered the Career Switcher Program on behalf of the Virginia State Department of Education since 1999. The General Assembly requested that the Board of Education develop an alternative pathway to teaching which would positively impact Virginia's teacher shortages. ODU was approached by the Department of Education to create and run the state's pilot Career Switcher Program. Since then, our program has trained hundreds of Career Switchers who have gone on to be valued educators in school districts statewide.

Varied program formats allow for extremely accelerated training, while accommodating participants who wish to remain employed in their current jobs while pursuing teacher licensure.

Level I preparation in instructional skills and classroom management is specific to content area and focuses on the "survival skills" of everyday classroom teaching. Opportunities for in-school observation offers participants the opportunity to make contacts in school districts while gaining knowledge about teacher responsibilities and instructional strategies.

The ODU Career Switcher Program, while offered in a non-credit format, will transfer six hours of experiential graduate academic credit toward a Master of Science in Education degree through the Darden College of Education. Career Switchers who engage in additional coursework may qualify to transfer more than six hours pending program approval.

Upon completion of Level I preparation, ODU Career Switchers will receive a Provisional License which qualifies them to teach in the Commonwealth of Virginia. The renewable Collegiate Professional Teacher License will be issued upon completion of Level II.

Programs for Continued Learning

The department operates as the continuing education operation for the Darden College of Education. In this capacity, the office provides professional and personal noncredit programs. Program offerings range from alternative teacher certification, short courses, workshops, and institutes as well as offering educational training and conferences for educators and counselors. The services we provide assist individuals seeking to gain knowledge and individual satisfaction in their professional and private lives.

The Child Study Center

The Lions Child Study Center, located on Hampton Boulevard on the Old Dominion University campus, serves as a cooperative link among the University, community, and early childhood, special education and speech pathology/audiology programs of the University. In conjunction with its mission of urban outreach, the center provides in-service education, consultation, and clinical services to the local community, agencies, institutions, and school systems. In addition to serving as a visible community resource for referral and information, the center also conducts on-site demonstrations for training and informational exchange, provides parent training, tutorial and assessment services, and develops intervention and service models.

Programs for Children

Mission Statement. Old Dominion University's primary purpose in the children's programs at the Child Development and Child Study Centers is to train teacher candidates and provide a setting for research conducted by the University community. A secondary mission is to provide exemplary child care for the greater Hampton Roads community.

The Child Development Center. The Old Dominion University Child Development Center is a full-service, full-time program offering quality care for children ages eight weeks through kindergarten. In each of seven classrooms, a lead teacher is assisted by practicum students from early childhood and other academic areas of study. The lead teacher is a master's-level professional, trained to be knowledgeable about and attentive to the individual needs of children. Teacher aides also are employed to work in the center and are chosen from students in various disciplines who are trained and interested in working with young children. The Child Development Center provides care for children 48 weeks of the year from 7:30 a.m. to 5:30 p.m. and is housed in two locations: 1520 West 48th Street (the five classes for younger children) and the Child Study Center on 45th Street (the two classes for the oldest children).

The Preschool/Kindergarten Program. The Preschool/Kindergarten Program operates three hours a day, five days a week and emphasizes developmentally appropriate practices for children ages 3-5. The overall curriculum includes art, music, science, reading and math readiness, physical education, computers, foreign language, and swimming. Children of kindergarten age are given a specific readiness program in preparation for their entrance into first grade. Lead teachers are assisted by graduate practicum students from early childhood education, as well as students from other academic areas of study, including speech-language pathology, psychology, leisure studies, elementary education and special education.

The Kiwanis Parenting Center

Old Dominion University's Kiwanis Parenting Center, a resource for the Hampton Roads community, provides education, training, research and support services for parents, professionals and Old Dominion students. Its purpose, which is to benefit children and enhance the lives of families, is realized through lectures, workshops, seminars and support groups conducted by and for community and University personnel and patrons. It is located on the second floor of the Lions Child Study Center and includes a large lecture hall, a parent library and a children's play room.

Speech and Hearing Clinic

The Speech and Hearing Clinic including the Scottish Rite Center provides diagnostic and remedial clinical services to speech-language and hearing impaired children and adults. It operates on a twelve-month, five day per week schedule. Referrals are accepted from medical and educational agencies. Speech-language services are provided by advanced undergraduate and graduate student clinicians in Old Dominion University's speech-language pathology program who are supervised by ASHA certified clinical faculty members. Audiology services are provided by clinical faculty members holding ASHA certification and by student clinicians who are supervised by these clinical faculty members. Clients typically served by the clinic display hearing, language, voice, fluency (stuttering) and articulation disorders as well as characteristics of social and foreign dialects.

Darden College of Education Graduate Courses

Course Prefixes

Community College Leadership — CCL

Counseling — COUN

College Counseling — CLCN

Community Counseling — CMCN

Mental Health Counseling — MHCN

School Counseling — SCCN

Early Childhood, Speech Language Pathology and Special Education — ESSE

Educational Curriculum and Instruction — ECI

Educational Leadership and Services—ELS

Exercise Science, Sport, Physical Education and Recreation

Physical Education — PE

Health Education — HE

Health and Physical Education — HPE

Recreation and Tourism Studies — RTS

Exercise Science, Sport, Physical Education and Recreation — ESPR

Exercise Science — EXSC

Sport Management — SMGT

Higher Education — HIED

Human Services — HMSV

Library Sciences — LIS

Occupational and Technical Studies

Occupational and Technical Education — OTED

Occupational and Technical Studies — OTS

Instructional Design and Technology — IDT

Interdisciplinary Studies — IDS

Community College Leadership — CCL

CCL 720/820. Community College Leadership. Lecture 3 hours; 3 credits. Prerequisite: acceptance into the doctoral program or permission of the instructor. A doctoral level seminar intended to provide theoretical and practical background on issues related to community college leadership and assist the student to develop the skills necessary to fulfill the responsibilities of a senior community college administrative leadership position. Of particular importance are skills needed for community college deans, vice presidents and presidents.

CCL 724/824. Community College Finance. Lecture 3 hours; 3 credits. Prerequisite: acceptance into the doctoral program or permission of the instructor. A doctoral level seminar intended to provide information about the financing and budgeting processes that are practiced in community colleges. This will be accomplished by examining the budget development and budget planning process and a survey of sources and uses of funds as well as the functions and techniques of responsible management of resources.

CCL 726/826. Community College Curriculum and Program Development. 3 credits. Prerequisite: acceptance into the doctoral program or permission of the instructor. A doctoral-level seminar intended to assist students to understand the development and management of the community college curriculum. It will do this by (1) examining processes practiced in the identification of courses and degree programs, (2) the review and approval processes of individual programs and courses, (3) assessment and other accountability activities, and (4) the authorizing processes and procedures for establishing or terminating courses or programs.

CCL 768/868. Internship in Community College Leadership. 3 to 6 credits. Prerequisite: acceptance into the doctoral program or permission of the instructor. The purpose of this course is to allow students to obtain hands-on experience in a

leadership role at a community college setting. The student will learn about leadership skills at the community college by observing his or her mentor/site supervisor and by being given leadership tasks associated with the site he or she has chosen.

CCL 795/895. Topics in Community College Leadership. 1 to 3 credits. Prerequisite: permission of the instructor.

CCL 830. Community College Politics and Policy Development. Lecture 3 hours; 3 credits. Prerequisite: acceptance into the doctoral program or permission of the instructor. This course will examine the political factors that may influence educational policy-decisions at community colleges and other institutions of higher education. This course will encourage students to pursue self-directed study of the relationships community college leaders build with community college boards of trustees, county commissioners, state legislators (with emphasis on the Commonwealth of Virginia), and federal representatives. The course also will require students to research and participate in debates on current political and ethical issues affecting the community college.

CCL 881. Dissertation Seminar. 3 credits. A seminar that focuses on the design, implementation, and evaluation of community colleges under real-life conditions in the field. Students and faculty work with community college decision makers utilizing problem solving skills and analysis.

CCL 899. Dissertation. 1 to 12 credits.

CCL 999. Community College Leadership 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Counseling — COUN

COUN 601. Principles of Professional Counseling and Ethics. Lecture 3 hours; 3 credits. Aligned with a spiral approach to learning, students will be introduced to theory, practice, methods, basic principles, and concepts used by counselors in educational settings and community agencies. In subsequent courses, these topics will be revisited in depth. The course will emphasize professional and ethical issues related to counseling.

COUN 630. Growth Group. Laboratory 2 hours; 1 credit. Prerequisites: Admission to Counseling Graduate Program or graduate program director approval. Students will participate as a member of a supervised small group. The goals of the group experience are to promote self-understanding, self-analytical skills, and interpersonal relationship skills.

COUN 631. Counseling for Lifespan Development. Lecture 3 hours; 3 credits. Prerequisites: Admission to Counseling Graduate Program or graduate program director approval. A study of phase and stage theories of lifespan development with application to counseling. Current research findings on major developmental issues (e.g., gender) will be emphasized.

COUN 633. Counseling and Psychotherapy Techniques. Lecture 3 hours; 3 credits. The course focuses on development of attitudes and skills essential to effective professional counseling. Emphasis is on conducting the helping interview, as well as conducting an intake interview, a mental status evaluation, a biopsychosocial history, a

mental health history, and a psychological assessment for treatment planning and caseload management.

COUN 634. Advanced Counseling and Psychotherapy Techniques. Lecture 3 hours; 3 credits. Prerequisite: COUN 633. Advanced skills and practice in techniques used by counselors.

COUN 635. Research and Program Evaluation. Lecture 3 hours; 3 credits. Introduction to qualitative and quantitative research and program evaluation.

COUN 642. Structured Counseling Groups. Lecture 3 hours; 3 credits. Prerequisites: Admission to Counseling Graduate Program or graduate program director approval; COUN 633. This course is designed to prepare students to facilitate structured counseling groups for children, adolescents and adults in a variety of settings.

COUN 644. Group Counseling and Psychotherapy. Lecture 3 hours; 3 credits. Prerequisites: Admission to Counseling Graduate Program or graduate program director approval; COUN 633 & 650. Developing effective group leadership competencies is the focus for the course. Identification of group dynamics, use of group level process, and the self-development of the leader are some major topics.

COUN 645. Testing and Client Assessment. Lecture 3 hours; 3 credits. Prerequisites: Admission to Counseling Graduate Program or graduate program director approval. This course examines individual and group approaches to formal and informal assessment techniques, including diagnosis. It includes an examination of: the history of assessment; basic test statistics; test worthiness (reliability, validity, and cross-cultural issues); the selection, administration, and interpretation of assessment instruments; and ethical and legal issues relative to assessment. The focus of this class is on major concepts and principles of psychological testing and evaluation and use of standardized instruments with differing populations.

COUN 647. Addictive Disorders. Lecture 3 hours; 3 credits. Prerequisites: Admission to Counseling Graduate Program or graduate program director approval; COUN 633 & 650. Examines the etiology, risk factors, assessment, counseling approaches and treatment of alcoholism and other addictions.

COUN 648. Foundations of Career Development. Lecture 3 hours; 3 credits. Prerequisites: Admission to Counseling Graduate Program or graduate program director approval; COUN 633, 645, & 650. Principles and theories of career development, occupational and educational information, employment trends, concepts and principles for effective work in educational and career planning and development are considered.

COUN 650. Theories of Counseling and Psychotherapy. Lecture 3 hours; 3 credits. A study of major theories of counseling and psychotherapy. The primary focus is on providing students with a theoretical foundation upon which to develop their own approach for providing counseling and psychotherapy.

COUN 655. Social and Cultural Issues in Counseling. Lecture 3 hours; 3 credits. Prerequisites: Admission to Counseling Graduate Program or graduate program director approval. Designed to engage helping professionals in cultural self-awareness and the search for solutions to disparities in society through counseling work. Emphasis on the social identities of gender, race, ethnicity, religion, ability, class, sexual orientation, and age.

COUN 665. Internship in Community Counseling. 3-6 credits. Prerequisites: Departmental Permission. This internship is designed to provide individual students with a planned program of advanced on-the-job professional experience in a community agency counseling agency. A university instructor will coordinate internship assignments. An experienced professional in the community agency setting will provide direct supervision. Available for pass/fail grading only.

COUN 666. Internship in College Counseling. 3-6 credits. Prerequisites: Departmental Permission. This internship is designed to provide individual students with a planned program of advanced on-the-job professional experience in a college or university setting. A university instructor will coordinate internship assignments. An experienced professional in the college or university setting will provide direct supervision. Available for pass/fail grading only.

COUN 667. Internship in Mental Health Counseling. 3-9 credits. Prerequisite: Admission to the Counseling Graduate Program or graduate program director approval, approved application; COUN 601, 644, 645, 648, 650, 669, 680, & 685. This counselor education experience is designed to provide a planned program of supervised clinical instruction in mental health counseling in an appropriate professional setting, including provision of direct service and performance of indirect professional activities under appropriate clinical supervision of a site supervisor as well as classroom instruction and supervision. This pass/fail course requires successful completion of 450 hours of counseling field placement work and 180 hours of direct service in each of two semesters of enrollment.

COUN 668. Internship in School Counseling. 1 - 6 credits. Prerequisite: Admission to the Counseling Graduate Program or graduate director approval; Approved application; COUN 601, 642 or 644, 645, 648, 650, 669, 676, & 678. This internship is designed to provide individual students with a planned program of advanced on-the-job professional experience in a school setting. A university instructor will coordinate internship assignments. An experienced professional in the school setting will provide direct supervision. Available for pass/fail grading only.

COUN 669. Practicum in Counseling. 3 credits. Prerequisites: Admission to the Counseling Graduate Program or graduate director approval; COUN 601, 603, 633, 642 or 644, & 650 (see Program Handbook for other prerequisites based on specialty area). This supervised experience will enable students to practice basic and intermediate individual and group counseling skills with clients while integrating knowledge and skills learned in previous course work.

COUN 670. Introduction to Counseling Supervision. Lecture 3 hours; 3 credits. Prerequisites: Admission to the Counseling Graduate Program or graduate director approval; COUN 669. This course provides an opportunity to learn one's personal style for supervision, to have supervised field supervision experiences and to gain an understanding of the different models of supervision.

COUN 676. Professional Issues in School Counseling K-12. Lecture 3 hours; 3 credits. Prerequisites: Admission to the Counseling Graduate Program or graduate director approval. A professional seminar that emphasizes the contemporary role of the school counselor as

leader and advocate in delivering school counseling programs to all students. Emphasis is placed on acquiring the awareness, knowledge and skills necessary to negotiate the cultural, educational, and contextual forces that impact the lives and academic achievement of students in a pluralistic society.

COUN 678. Counseling Children and Adolescents in School Settings. Lecture 3 hours; 3 credits. Prerequisites: Admission to the Counseling Graduate Program or graduate director approval; COUN 633 & 650. This course will provide an overview of theories and techniques of counseling children and adolescents in school settings. Emphasis will be placed upon the counselor's role as a facilitator of normal developmental processes to promote academic success.

COUN 679. School Counseling Program Development K-12. Lecture 3 hours; 3 credits. Prerequisites: Admission to the Counseling Graduate Program or graduate director approval; COUN 642 or 644, 648, & 676. This course is designed as a capstone experience that synthesizes graduate course work into a practical school counseling program manual. Emphasis is placed on assessment, data collection and analysis, design and development, implementation and evaluation of systemic school counseling programs K-12. Specific emphasis is given to the integration of assessed needs, the National Standards for School Counseling Programs and the Virginia Standards of Learning.

COUN 680. Mental Health Counseling. Lecture 3 hours; 3 credits. Prerequisites: Admission to the Counseling Graduate Program or graduate director approval. This course will examine the broad range of roles and functions of the mental health counselor within contemporary professional practice settings.

COUN 681. Couples Counseling. Lecture 3 hours; 3 credits. Prerequisites: Admission to the Counseling Graduate Program or graduate director approval; COUN 633 & 650. Couples counseling focuses on development of effective counseling skills in working with couples.

COUN 685. Diagnosis and Treatment Planning in Mental Health Counseling. Lecture 3 hours; 3 credits. Prerequisites: Admission to the Counseling Graduate Program or graduate director approval; COUN 633 & 650. A course focused on developing knowledge, attitudes, and skills essential to effective DSM-IV diagnosis, client conceptualization assessment, and clinical treatment planning. Emphasis on the use of client conceptualization models as a basis for treatment planning in mental health counseling.

COUN 691. Family Systems and Family Development. Lecture 3 hours; 3 credits. Prerequisites: Admission to the Counseling Graduate Program or graduate director approval; COUN 633 & 650. The course offers a study of the family as a system, family life cycle stages, tasks, and difficulties that families may experience as they move through their developmental stages. Concepts and principles applicable to helping people within a systems perspective will also be discussed.

COUN 695. Topics in Counseling. Lecture 1-6 hours; 1-6 credits. Prerequisites: Admission to the Counseling Graduate Program or graduate director approval. The study of selected topics in counseling.

COUN 707/807. Adult and College Student Development. Lecture and discussion 3 hours; 3 credits. Exploration of theories informing practice

regarding late adolescent, young adult, and adult psychological and cognitive development, adjustment, and learning in the two- and four-year college and university context. Influences of individual differences highlighted. Applications for college counseling, higher education, and community college practitioners, professionals, and leaders.

COUN 742/842. Advanced Counseling Theory and Practice. Lecture 3 hours; 3 credits. Prerequisites: COUN 601, 630, 633, 645 and 650. An in-depth study of selected counseling theories through the study of cases.

COUN 744/844. Advanced Group Counseling. 3 hours; 3 credits. Prerequisites: COUN 601, 630, 633, 644, 645, and 650. Development of group leadership skills through group experiences in class and in the field.

COUN 747/847. Chemical Dependency Counseling. Lecture 3 hours; 3 credits. Prerequisites: COUN 601, 630, 633, 645, and 650. This course will be a skills based, technique-focused class geared toward the counseling professional who works with chemically dependent clients. Current theories and models of diagnosis and treatment will be the central themes with practical applications.

COUN 781/881. Family Therapy. Lecture 3 hours; 3 credits. Prerequisites: COUN 601, 630, 633, 644, 645, and 650. A study of theories and practice of family therapy.

COUN 795/895. Topics in Counseling. Lecture 1-6 hours; 1-6 credits. The study of selected topics in counseling.

COUN 797/897. Independent Study. Consultation 1-6 hours; 1-6 credits. Individual study under the supervision of a graduate faculty member.

COUN 801. Current Issues in Counseling and Counselor Education. Lecture 3 hours; 3 credits. The course will focus on the current issues in counseling to include the role of ethical and legal considerations in counselor education and supervision, social and cultural issues to include social change theory and advocacy action planning, and developmental counseling.

COUN 820. Counselor Education Teaching and Practice. Lecture 3 hours; 3 credits. Prerequisites: three or more seminars presented by campus Instructional Support Services to include Blackboard, Development of Syllabi, Televised Instruction and Classroom Assessment. This course prepares students to teach counseling and related courses. Topics covered are learning theories, retention of material, motivation, classroom instructional strategies and techniques, and assessment of learning from the core learning expectations. Students will teach a semester course under supervision of the instructor.

COUN 835. Advanced Counseling Research and Program Evaluation. Lecture 3 hours; 3 credits. Prerequisites: ELS 832, 833, and ECI 890. The doctoral-level course examines advanced topics and controversies in qualitative and quantitative counseling research; this integration of theoretical with applied counseling material will augment the department's standard doctoral research offerings.

COUN 840. Advanced Diagnosis and Treatment Planning. Lecture 3 hours; 3 credits. Prerequisites: COUN 801 and 742/842. A course on advanced knowledge, advanced clinical skills, and highly defined clinical attitudes essential to proficient DSM-IV diagnosis, accurate client conceptualization and assessment, and advanced clinical treatment planning. Emphasis on the use

of client conceptualization models as a basis for advanced treatment planning.

COUN 846. Advanced Counseling Supervision. Lecture 3 hours; 3 credits. Prerequisites: COUN 670, 801, 842, 844, and 869. This course provides advanced training and skill development in supervision. Specific topics in supervision will also be examined. These include: ethical and legal issues, multicultural competency in supervision; theories of counselor development; theories/models, processes, and skills in supervision. Students will conduct the COUN 669 practicum classes under faculty supervision.

COUN 848. Multicultural Perspectives in Counselor Education, Supervision, and Research. Lecture 3 hours; 3 credits. Prerequisites: Admission to PhD Program or Graduate Program Director Approval. Counseling doctoral students will study multicultural issues in counselor preparation graduate programs, counseling supervision, and counseling research.

COUN 850. Advanced Issues and Practices in School Counseling. Lecture 3 hours; 3 credits. Prerequisites: COUN 801 and ELS 833. This course has a focus on advanced theory, practice, and research in school counseling. Specific topics include: advocacy; leadership; systems analysis and organizational development; supervision and training; development of multicultural competency; ethical and legal issues; curriculum development; coordination, collaboration, and consultation; and program development and evaluation.

COUN 868. Internship in Counseling. 3-12 credits. This internship is designed to provide individual students with a planned program of advanced on-the-job professional experience in a college or community/agency setting. Internship assignments will be controlled and coordinated by a university instructor. Direct supervision is given by an experienced professional in the setting.

COUN 869. Advanced Supervised Practicum in Counseling. 3 credits. Prerequisites: COUN 801, 820, 742/842, 744/844. This advanced supervised practicum in counseling experience will enable doctoral-level students to develop and/or refine advanced counseling skills and conceptually link counselor practice and supervision.

COUN 898. Dissertation Seminar. Lecture 3 hours; 3 credits. Prerequisites: COUN 801, ELS 832, 833, ECI 890, COUN 820, 835, 742/842, 744/844, 846, 869, and at least one specialty course. This seminar is designed to assist students in making substantive progress in identifying and developing their dissertation proposal. Students will critically examine the current literature associated with their research interests and examine applicable conceptual constructs and methodologies.

899. Dissertation. 1-12 credits.

Early Childhood, Speech Language Pathology and Special Education — ESSE

ESSE 400/500. Foundations of Special Education: Legal Aspects and Characteristics. Lecture 3 hours; 3 credits. Prerequisite: junior standing. The course provides an introduction and overview of the field of special education from the perspective that it is a subsection of general education and that the field is in transition by virtue of philosophical, legislative and programmatic changes. Legal aspects, regulatory requirements, and critical analyses of research are addressed. This course includes a broad overview of the expectations associated with the

identification, characteristics, and education of students with disabilities.

ESSE 402/502. Instructional Design I: Learner Characteristics and Assessment. Lecture 3 hours; 3 credits. Prerequisite: ESSE 400/500. The intent of this course is to provide pre-service teachers with: (a) knowledge of the characteristics of students with mild disabilities who are accessing the general curriculum, K-12, including, but not limited to, LD, BD, and EMR, and (b) the ability to develop knowledge and skill in the selection, administration, scoring and interpretation of standardized/norm-referenced assessments of exceptional learners. Administering formal and informal assessment tools and the development of an IEP are emphasized. The use of assessment data to improve instruction and student performance is discussed.

ESSE 403/503. Directed Field Experience in Special Education. Lecture 2 hours; 2 credits. Practicum of 45 hours required. Prerequisites: ESSE 400/500 and 402/502 and passing scores on PRAXIS I or equivalent. Corequisite: ESSE 483/583. This course provides variable hours of direct participation in a community or educational setting with individuals with special needs. The course includes specific skills of program planning, implementation, evaluation and classroom management.

ESSE 404/504. Medical Aspects of Disabling Conditions. Lecture 3 hours; 3 credits. Prerequisites: ESSE 400/500 and junior standing. This course reviews medical conditions present among individuals with disabilities and implications for classroom instruction.

ESSE 406/506. Students with Diverse Learning Needs in the General Education Classroom. Lecture 3 hours; 3 credits. Prerequisite: junior standing. This course introduces general education teachers to the legal aspects and educational needs of at-risk students and those with disabilities. Emphasis is on characteristics of special needs children and procedures for effective academic, behavioral, and social integration of these children in the general education classroom.

ESSE 411/511. Classroom and Behavioral Management Techniques for Students with Diverse Needs. Lecture 3 hours; 3 credits. Co- or prerequisite: ESSE 400/500. This course will address classroom management techniques and individual interventions based upon behavioral, cognitive, affective, social, and ecological theory and practice. The course will focus on the field of applied behavior analysis, including best practices in the areas of data collection, program selection, program implementation, and data analysis. Positive behavior management and supports and functional behavioral assessment will be emphasized.

ESSE 414/514. Psychoeducational Assessment for Students with Diverse Learning Needs. Lecture 3 hours; 3 credits. Prerequisite: ESSE 400/500. This course focuses on selection, administration, scoring and interpretation of standardized, informal, and curriculum-based instruments. Emphasis is on sound decision-making for curricular placement and instruction. Use of various computer-assisted programs, along with error analysis strategies applied to major core and content areas as well as transition assessment, is included.

ESSE 415/515. Instructional Design II: Curricular Procedures and Individualized Education Planning. Lecture 3 hours; 3 credits.

Practicum of 45 hours is required. Prerequisites: ESSE 400/500, 402/502, and passing scores on PRAXIS I or equivalent. The intent of this course is to provide preservice teachers with: (a) knowledge of research-based instruction for K-12 students with disabilities and those who are gifted; (b) knowledge and skill in using data collection to make decisions about student progress, instruction, program, accommodations and teaching methodology for exceptional learners, and (c) knowledge and skill in planning, developing and implementing individual educational plans and group instruction for diverse exceptional learners who are accessing the general education curriculum and the standards of learning.

ESSE 417/517. Collaboration and Transitions. Lecture 3 hours; 3 credits. Co- or prerequisite: ESSE 400/500. This course addresses the complex issues surrounding families and children with disabilities and transitions across the lifespan, as well as effective collaboration with families and professionals to support inclusion and/or effective early intervention services, educational programs and transition services for students at-risk and students with disabilities. Emphasis is on successful professional collaboration and effective relationships in educational, transition, and family settings.

ESSE 430/530. The Family and Child with Special Needs: Lifespan Transitions. Lecture 3 hours; 3 credits. Prerequisite: ESSE 400/500. This course examines the initial and subsequent family response to the challenge of a child with a disability. Emphasis is on understanding the complex issues surrounding families and children with disabilities and transitions across the lifespan, including issues of peer networks, agency assistance, training/counseling, and sources of support.

ESSE 432/532. Characteristics of Students with Visual Impairments. Lecture 1 hour; 1 credit. Prerequisite: ESSE 400/500. Provides an overview of the characteristics of and services to persons with visual impairments, including the impact of visual impairment on infants' and children's growth and development, child and adolescent emotional and social development, and family interaction patterns. Considers the educational, conceptual, psycho-social, and physical implications of a visual impairment.

ESSE 433/533. Braille Code. Lecture 3 hours; 3 credits. Co- or prerequisites: ESSE 400/500 and 432/532. This course provides instruction in the development, use, and application of the Braille literary code and its implications for educational/literacy programs for students with visual disabilities. Students will develop the skills to read and write contracted and uncontracted Braille, while acquiring instructional methodologies for teaching children who are blind to read and write. Sources of Braille materials for educational purposes are identified.

ESSE 434/534. Medical and Educational Implications of Visual Impairments. Lecture 3 hours; 3 credits. Co- or prerequisites: ESSE 400/500 and 432/532. Provides an introduction to anatomy and physiology of the visual system and the educational implications of visual pathology. Topics include anatomy of the human eye, normal visual development, pathology of the eye, examination procedures for the identification of visual pathology, and the effects of pathology on visual learning and development.

ESSE 435/535. Orientation and Mobility. Lecture 2 hours; 2 credits. Co- or prerequisites: ESSE 400/500 and 432/532. Provides the

foundation for understanding the components and essence of orientation and mobility. Establishes how the need for independent travel in the blind population created the field of O&M. Explores the philosophy and history of orientation and mobility including cane instruction, dog guides and methods of travel. Addresses techniques in developing orientation skills and basic mobility instruction. Motor and concept skill development are emphasized.

ESSE 436/536. Curriculum and Assessment of Students with Visual Impairments. Lecture 3 hours; 3 credits. Co- or prerequisites: ESSE 400/500 and 432/532. Provides students with knowledge and understanding of the educational assessment of students with visual impairments and additional disabilities including deaf-blindness. Students will practice assessing and planning educational programs for students with visual impairments. Addresses assessment of technology for students with visual impairments. Examines determination of learning needs and appropriate learning media, relationship of assessment, IEP development, and placement.

ESSE 437/537. Assistive Technology for People with Sensory Impairments. Lecture 2 hours; 2 credits. Co- or prerequisites: ESSE 400/500 and 432/532. This course is designed for professionals and/or students interested in serving the visually impaired/blind population or hearing impaired/deaf population. It is designed to heighten the awareness of participants to specific technology and resources available to enhance and improve the ability of individuals with visual and hearing impairments to succeed in school, daily living activities and employment. Knowledge and awareness components of this course will be delivered via distance education.

ESSE 447/547. Introduction to Language Disorders in Children. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. This course presents an introduction to the various language disorders manifested by children and adolescents with a focus on characteristics, etiologies and general intervention approaches.

ESSE 448/548. Speech-Language and Hearing Programs in the Public Schools. Lecture 3 hours; 3 credits. Prerequisites: ESSE 450/550 and 460/560. The emphasis of this course is on the organization and administration of public school speech-language and hearing programs, as well as clinical, professional and legal issues related to service delivery.

ESSE 449W/549. Orientation to Clinical Procedures in Speech-Language Pathology. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. This course provides an introduction to basic clinical procedures and competencies in speech-language pathology with an emphasis upon language sampling and identification of syntactic elements. The course also includes structured and supervised observation activities.

ESSE 450/550. Survey of Communication Disorders. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. This course is designed to acquaint the student with recognition, identification, and understanding of speech and language disorders.

ESSE 451/551. Articulation and Phonological Disorders. Lecture 3 hours; 3 credits. Prerequisites: ESSE 352 and 450. This course emphasizes causes, identification and treatment of articulation and phonological disorders.

ESSE 452/552. Voice Disorders. Lecture 3 hours; 3 credits. Prerequisites: ESSE 351 and 450. This course focuses upon anatomical and physiological bases, etiologies, assessment and treatment of voice disorders.

ESSE 453/553. Language Development. Lecture 3 hours; 3 credits. Prerequisite: ESSE 450. This course emphasizes language development from the perspective of the speech-language pathologist.

ESSE 454/554. Clinical Practica in Speech Pathology/Audiology I, II, III. Lecture 3 hours; practicum 6 hours; 4 credits each, 3 separate semesters. Prerequisites: ESSE 351 or 650, 352, 449W/549, 450/550, 451/551, 453/553, 459/559, 460/560, and permission of program faculty. These practica are designed to provide students with experiences in the evaluation and treatment of communication disorders. (qualifies as a CAP experience)

ESSE 458/558. Speech and Hearing Science. Lecture 3 hours; 3 credits. Prerequisite: junior standing or permission of the instructor. The content of this course focuses upon basic acoustics, speech acoustics, psychoacoustics, speech perception, and clinical laboratory instrumentation. The course is designed to provide fundamental information regarding normal and abnormal aspects of speech and hearing processes.

ESSE 459/559. Seminar in Speech Pathology Methods and Materials. Seminar 3 hours; 3 credits. Prerequisites: ESSE 450 and 451. This course focuses upon current therapy methods, equipment, and materials which are utilized in the remediation of communicative disorders.

ESSE 460/560. Hearing Disorders and Basic Audiometry. Lecture 3 hours; 3 credits. Prerequisite: ESSE 351. A study of the physics of sound, anatomy, and physiology of the human ear, basic audiometry and hearing disorders.

ESSE 461/561. Aural Rehabilitation I. Lecture 3 hours; 3 credits. Prerequisites: ESSE 351 and 460. A study of audiological findings and the implications for hearing therapy; speech and language development of the deaf.

ESSE 465/565. Signing I-Beginning Nonverbal Communication. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor.

ESSE 474/574. Foundations and Contemporary Issues in Early Childhood Education. Lecture 3 hours; 3 credits. Prerequisite: junior standing. This course introduces students to objectives, curricula, and organization of early childhood education as it is practiced throughout the United States and other countries. Foundations of education programs and current research and practices related to the education of young children will be addressed with an emphasis on sociological, cultural, historical, and philosophical factors.

ESSE 478/578. Integrating Instruction Across the Curriculum PreK-6. Lecture 3 hours; 3 credits. Prerequisite: junior standing or permission of the instructor. Following a theory into practice philosophy and building on the instructional strategies for specific disciplines, students explore, develop, and use advanced instructional materials, technologies, and activities to promote interdisciplinary and multidisciplinary instruction across the curriculum in grades PreK-6 in support of national standards and the Virginia Standards of Learning.

ESSE 479/579. Classroom Management and Practice PreK-3; PreK-6. Lecture 3 hours; 3 credits. Prerequisites: ECI 301 or 290, passing scores on PRAXIS I or equivalent SAT or ACT

scores as established by VA State Board of Education, acceptance into teacher education, no grade less than C- in content area and professional education core, minimum major and overall GPA or at least 2.75 and at least two of the following courses: ESSE 478/578, ECI 432/532, ECI 433/533, ECI 434/534, ECI 435/535. Course prepares prospective PreK-3 and PreK-6 teachers to provide instruction and management addressing the intellectual, physical, emotional and social needs of PreK-6 learners founded in empirically based practice. The field based component (70 hours) includes participation in PreK-6 classrooms in the Child Study Center and in the public schools. Attendance at seminars and debriefing sessions is required.

ESSE 483/583. Field Experience Seminar in Special Education. Lecture 1 hour; 1 credit. Prerequisites: ESSE 313, 400/500, 402/502. Co-requisite: ESSE 403 for 483. Explores issues, problems, concerns and processes related to teaching and entering the profession of teaching. Passing scores on the Virginia Communication and Literacy Assessment (VCLA) and Virginia Reading Assessment (VRA) will be required by the end of the course.

ESSE 486/586. Teacher Candidate Internship for Special Endorsement. 3-12 credits. Five days per week; full semester. Prerequisites: completion of the approved teacher education program in the major area, departmental approval, passing scores on PRAXIS I or equivalent, passing scores on the VCLA, VRA, and the appropriate PRAXIS II content examination, and permission of the director of teacher education services. Available for pass/fail grading only. (qualifies as a CAP experience)

ESSE 487/587. Seminar in Student Teaching. Lecture 2 hours; 2 credits. This course must be taken concurrently with student teaching. Presentation of topics related to the student teaching experience. Available for pass/fail grading only.

ESSE 492/592. Integrating Mathematics and Science Across the Curriculum, PK-3. Lecture 3 hours; 3 credits. Prerequisite: junior standing. This course has a theory-into-practice goal. The focus for this class will be to develop and use teaching strategies and techniques in the content area of mathematics and science, which are based on Piaget's theory of constructivism and are compatible with the NCIM & NSE Standards and the Virginia SOLs. Practical ways of encouraging thinking about math and science by young children, PK-3, and the natural integration of these subjects across the early childhood curriculum will be emphasized.

ESSE 493/593. Integrating Children's Literature, Language Arts and Social Studies Across the Early Childhood Curriculum. Lecture 3 hours; 3 credits. Prerequisite: junior standing. This course offers a review of literary materials suitable for nursery, kindergarten and early elementary school children. Social issues affecting children and early childhood literature related to these issues, the use of teaching strategies and techniques in the content areas of history, geography, economics and civics which are based on Piaget's theory of constructivism, the National Council of Teachers of English and the National Council for the Social Studies standards, and the Virginia SOLs are emphasized.

ESSE 495/595. Topics in Education. 1-6 credits. Prerequisite: junior standing or permission of the instructor. Selected topics in education.

ESSE 497/597. Independent Study in Special Topics in Education. 1-3 credits. Prerequisite: junior standing or permission of the instructor. Independent study of selected topics.

ESSE 617. Collaboration and Consultation for Students with Diverse Learning Needs. Lecture 3 hours; 3 credits. Co- or prerequisites: ESSE 400/500 or ESSE406/506. This course addresses the growing popularity of professional collaboration to support "stay-put" programs for students at-risk and students with disabilities. Emphasis is on interpersonal and communication skills, problem solving in dyads or groups, and the selection, implementation, and evaluation of various collaborative arrangements.

ESSE 618. Characteristics and Advanced Procedures: Emotional and Behavioral Disorders. Lecture 3 hours; 3 credits. Practicum of 45 hours required. Prerequisites: ESSE 400/500 and 415/515 or equivalent and passing scores on PRAXIS I or equivalent*. This course addresses characteristics and various approaches to the education and treatment of emotional/behavioral disorders. Emphasis is on group/individualized programming that addresses social, emotional, academic and behavioral needs. Behavior measurement and direct observation, problem behavior specification, intervention development and implementation, data collection and analysis, curricular adaptation, and teacher collaboration skills for successful regular classroom reintegration and transition are also discussed.

ESSE 621. Effective Interventions for Children and Youth with Challenging Behavior. Lecture 3 hours; 3 credits. Practicum of 45 hours required. Prerequisites: ESSE 400/500 and 411/511 or equivalent and passing scores on PRAXIS I or equivalent*. Students with challenging behavior pose a tremendous challenge to school personnel. Along with the growing incidence of behavior problems, there has been a dramatic increase in the number of research-supported interventions. Emphasis is on assessment of the structural and functional properties of problem behavior to facilitate development of interventions that match the nature and severity of the problem behavior. The course focuses on gaining knowledge of the likely source(s) of challenging behavior, including various strategies to document the environmental determinants of the behavior, establishment of school-wide, classroom-level, and student-specific intervention programs and ways to document the outcome of those interventions. Attention is given to adult- as well as peer-mediated intervention options for problem behavior reduction/replacement among children and youth from diverse backgrounds and across categories of exceptionality.

ESSE 623. Characteristics and Advanced Procedures: Mental Retardation. Lecture 3 hours; 3 credits. Practicum of 45 hours required. Prerequisites: ESSE 400/500 and 415/515 or equivalent and passing scores on PRAXIS I or equivalent*. The course examines the characteristics and various approaches to the education and treatment of students with mental retardation and developmental disabilities. Assessment, curriculum development, instructional design, appropriate placement setting, transition and utilization of environmental resources are emphasized.

ESSE 624. Characteristics and Assessment of Learning Disabilities. Lecture 3 hours; 3 credits. Practicum of 45 hours required. Prerequisites: ESSE 400/500, 415/515 and passing

scores on PRAXIS I or State Board of Education-approved SAT or ACT scores. This course will present professional educators the history of the field, federal and state definitions, and current issues related to the characteristics of learning disabilities, including the academic and social characteristics of LD, as well as informal and formal assessment procedures. Placement options and related services will be covered.

ESSE 625. Characteristics of Students with Autism Spectrum Disorders. Lecture 3 hours; 3 credits. Prerequisites: ESSE 400/500 and ESSE 415/515 or equivalents. This course includes a review of characteristics of students on the autism spectrum, including those with autism, Asperger disorder, & PDD-NOS.

ESSE 626. Characteristics and Advanced Procedures: Learning Disabilities. Lecture 3 hours; 3 credits. Practicum of 45 hours required. Prerequisites: ESSE 400/500, 415/515 and passing scores on PRAXIS I or equivalent*. This course provides the professional educator with a variety of educational procedures for students with learning disabilities, including diagnostic assessment, causal nature, and research based instructional strategies for teaching students with learning disabilities. This course has an applied emphasis and includes a 45-hour practical experience with students with learning disabilities.

ESSE 627. Instructional Strategies for Students with Autism Spectrum Disorders. 3 credits. Practicum of 45 hours required. Prerequisites: ESSE 400/500, 415/515 and passing scores on PRAXIS I or equivalent*. This course includes a review of intervention strategies for students on the autism spectrum, including those with autism, Asperger disorder, and PDD-NOD.

628. Teaching Students with Severe Disabilities. Lecture 3 hours; 3 credits. Practicum of 45 hours required. Prerequisites: ESSE 400/500, 411/511 and passing scores on PRAXIS I or State Board of Education-approved SAT scores*. This course addresses the characteristics and needs of individuals with severe disabilities. Emphasis is on assessment, program development, and instruction to address the needs of individuals with severe disabilities.

ESSE 630. Teaching Preschoolers with Disabilities. Lecture 3 hours; 3 credits. Practicum of 45 hours required. Prerequisites: ESSE 400/500 and passing scores on PRAXIS I or State Board of Education-approved SAT or ACT scores*. This course is designed to prepare students in curricula, materials and methods of instruction for preschool-aged (2 to 9 years) children with special needs. Programming for self-help, social, language, motor, and cognitive development are addressed. Data collection, program organization, and classroom planning are also covered.

ESSE 631. Developmental and Ecological Assessment Strategies. Lecture 3 hours; 3 credits. Practicum of 45 hours required. Prerequisites: ESSE 400/500 or the equivalent and passing scores on PRAXIS I or State Board of Education-approved SAT or ACT scores*. This course provides students with the skills necessary for assessment of atypical early development as well as best practices in assessing functional skills in students with severe disabilities. Students will explore and give assessments to children from birth to 9 years of age in addition to students with severe disabilities.

ESSE 633. Sensorimotor Development and Intervention Strategies. Lecture 3 hours; 3 credits. Practicum of 45 hours required. Prerequisites: ESSE 400/500 and passing scores on

PRAXIS I or State Board of Education-approved SAT or ACT scores*. This course reviews typical and atypical development during infancy and intervention approaches for individuals, regardless of age, who function at developmental levels between birth and two years. Emphasis is on techniques for working with students having physical disabilities.

ESSE 634. Capstone Seminar. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. This course aids the student in reviewing and integrating current research in both general and special education and in the particular area of emphasis.

ESSE 635. Research Methods in Education. Lecture 3 hours; 3 credits. Types of research, selection of problems, location of educational information, collection and classification of data, organization, presentation and interpretation of materials.

ESSE 636. Problems in Education. Lecture 3 hours; 3 credits. Prerequisite: ESSE 635 and/or permission of the instructor. Application of research procedures culminating in student study of selected topics.

ESSE 637. Infant/Family Intervention and Teamwork. Lecture 3 hours; 3 credits. Practicum of 45 hours required. Prerequisites: 400/500 and 630 and passing scores on PRAXIS I or State Board of Education-approved SAT or ACT scores*. This course prepares professionals from cross-discipline backgrounds to serve families with children who are at-risk and disabled from birth through age three. Emphasis is place on the development of the IFSP, procedures, materials and curriculum for this population. A family-centered approach is stressed.

ESSE 638. Teaching methods for Students with Visual Impairments. Lecture 3 hours; 3 credits. Co/Prerequisites: ESSE 400/500 and ESSE 432/532. Emphasizes methods of teaching compensatory skills, the core curriculum, and technology for use by students who are blind and visually impaired. Addresses curriculum development, adaptations, and teaching methodology for individuals with visual impairments. Provides information on adaptations within various educational programs and adaptation of general education classroom materials and procedures for use with blind and low vision children and youth.

ESSE 639. Braille Reading and Writing. Lecture 3 hours; 3 credits. Prerequisites: ESSE 433/533. Co/Prerequisites: ESSE 400/500 and ESSE 432/532. This course provide basic instruction on transcription of advanced Braille codes, including: music, foreign language, chemistry, computer Braille, and Nemeth Code (Braille math code). Introduces techniques for teaching skills in each code. Explores technology tools used to create Braille and tactile materials in addition to other assistive technologies used for instruction in math and science.

ESSE 650. Organic Speech-Language Disorders. Lecture 3 hours; 3 credits. The content of this course focuses upon the structural and neurological bases of speech and language disorders, particularly those related to laryngeal and central nervous system pathologies.

ESSE 651. Language Development and Language Disorders. Lecture 3 hours; 3 credits. Prerequisite: ESSE 553 or equivalent, or permission of the instructor. This course provides a detailed analysis of current literature pertinent to language development, diagnosis and intervention.

ESSE 652. Articulation and Phonological Disorders. Lecture 3 hours; 3 credits. Prerequisite: ESSE 451/551. The principal emphasis of this course is clinical intervention for phonological and articulation disorders including motor speech disorders.

ESSE 654. Advanced Clinical Techniques in Speech Pathology. Lecture 3 hours; 3 credits. This course emphasizes current techniques in the management of voice, language, stuttering and articulation disorders.

ESSE 655. Cleft Palate. Lecture 3 hours; 3 credits. The purpose of this course is to investigate the etiologies, communicative disorders, diagnostic methods, and therapeutic techniques related to cleft palate and related disorders.

ESSE 656. Theories and Therapies in Stuttering. Lecture 3 hours; 3 credits. This course emphasizes current etiological theories, research, diagnostic procedures and therapeutic techniques related to stuttering.

ESSE 657. Aphasia. Lecture 3 hours; 3 credits. The objective of this course is to investigate the etiologies, communicative disorders, diagnostic methods and therapeutic techniques related to aphasia.

ESSE 658. Swallowing Disorders. Lecture 3 hours; 3 credits. This course reviews the structures and neural bases of swallowing, common etiologies that cause dysphagia, and clinical techniques used in assessment and management of swallowing disorders in pediatric and adult populations.

ESSE 660. Procedures in Audiology. Lecture 3 hours; 3 credits. Prerequisite: ESSE 440.

ESSE 669. Directed Field Project in Early Childhood, Speech-Language Pathology and Special Education. 1-6 credits; 50 hours per credit. Prerequisite: two of the following - ESSE 618, 621, 623, 624, 626, 628, 630 and passing scores on PRAXIS I or State Board of Education-approved SAT or ACT scores*. The course provides supervised involvement of the student in a practicum setting where the student and the instructor work together closely to develop curriculum and gain expertise in teaching specific topics of importance to special educators.

ESSE 670. Assessment and Evaluation. Lecture 3 hours; 3 credits. Measurement and evaluation principles and procedures for assessing and promoting children's learning and development will be addressed with an emphasis on the PK-6 age child. Program evaluation and interpretation of standardized tests will also be emphasized.

ESSE 677. Advanced Child Development Theory and Research. Lecture 3 hours; 3 credits. This course focuses on developing an in-depth understanding of major theories of children's learning and development. The course requires that students learn the concepts and terminology associated with each theory and be able to use them in analyzing, interpreting, promoting, and evaluating children's growth and learning in the classroom. Research related to the classroom application of these theories is examined and evaluated based on principles of research design and interpretation.

ESSE 679. Advanced Classroom Management and Practicum in PreK-6. Lecture 3 hours; 3 credits. Prerequisite: ECI 436/536 for students in the PreK-6 curriculum. This course will examine advanced methods for educators to use in order to make their classroom teaching and management more efficient and effective. This will include supervised involvement of the student

in a practicum setting where the student, instructor and classroom teacher work together closely to develop knowledge and gain expertise in teaching children in a positive and effective learning environment. A weekly seminar is required.

ESSE 688. Practicum in Early Childhood. 1-6 credits. Supervised involvement of the student in a practicum setting where the student and the instructor work together closely to develop curriculum and gain expertise in teaching specific topics of importance to early childhood educators. A weekly seminar is required.

ESSE 690. The Child and the Family. Lecture 3 hours; 3 credits. This course will examine children in the context of the families in which they live. Family systems theory provides the basis for study, and students do an in-depth examination of their own families of origin. The stages of the family life cycle are taught; principles of healthy family functioning are emphasized to promote healthy growth for children.

ESSE 695. Topics in Education. Lecture 1-3 hours; 1-3 credits each semester. Prerequisite: permission of the instructor. This course offers selected topics designed to permit small groups of qualified students to work on subjects of mutual interest in the special education field.

ESSE 698/699. Thesis. 3-6 credits. Prerequisite: permission of instructor.

ESSE 700/800. Social/Emotional Aspects of Child Development. Lecture 3 hours; 3 credits. The emphasis of this course will be on the theoretical approaches to the social/emotional development of the child that include the psychodynamic, humanistic, cognitive, behavioral, and social learning models as applied to responsive practices that promote the healthy emotional well being of children.

ESSE 701/801. Historical and Contemporary Research in Special Education. Lecture 3 hours; 3 credits. This course covers contemporary and historical topics related to problem issues in special education. This is a course of study that will enable participants to examine various research topics in special education and take and defend a position on an issue.

ESSE 702/802. Cognitive Processes and Learning Strategies for Students with Special Needs. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. The intent of this course is to provide an overview of research and critical issues relative to the cognitive and affective development of individuals with disabilities. Research-based interventions that address deficits of cognitive processes will be discussed and specific learning strategies will be presented.

ESSE 707/807. Advanced Instructional Procedures in Special Education. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. This course provides students with advanced skills in educational planning, development, and implementation for students with learning problems. Techniques focus on inclusive and self-contained classroom arrangements.

ESSE 710/810. Models of Parent, Child, Social Interaction. Lecture 3 hours; 3 credits. This course will examine the family with an emphasis on parent/child interactions. In addition, a model for ecological intervention will be discussed.

ESSE 714/814. Alternative Strategies for Secondary Students. Lecture 3 hours; 3 credits. Prerequisites: ESSE 400/500, 415/515, and passing scores on Praxis I or state Board of Education approved SAT or ACT scores*. Practicum of 45 hours required. This course is designed to provide

students with an opportunity to examine and develop curriculum strategies and adaptations which may be used to meet the needs of students with diverse learning needs.

ESSE 715/815. Alternative Strategies for Elementary Students: Prevention and Intervention. Lecture 3 hours; 3 credits. Prerequisites: ESSE 400/500, 415/515, and passing scores on Praxis I or state Board of Education approved SAT or ACT scores*. Practicum of 45 hours required. The intent of this course is to provide pre-service and in-service teachers with the knowledge and skill to collaborate with other professionals to identify and remediate students who are at-risk for school problems due to academic challenges and/or behavior, and to effectively support students with identified mild disabilities in general education classrooms. The course focuses on developing proactive pre-referral interventions and working with general educators to develop and implement effective interventions, accommodations, modifications and supports for students with mild difficulties in general education classes.

ESSE 720/820. Curriculum and Instruction: Research Into Practice. Lecture 3 hours; 3 credits. Prerequisites: two of the following - ESSE 618, 621, 623, 624, 626, 628, 630, 714, 715. This course provides an overview of research methods employed in the field of special education. Current trends related to curriculum and instruction in general and special education will be investigated. Strategies and procedures for identifying learner characteristics and application of that knowledge will be included. Implementation of quality curricular modifications and/or instructional accommodations for students with diverse needs in a variety of educational settings and evaluation of instruction will be addressed.

ESSE 730/830. Single Subject Research. Lecture 3 hours; 3 credits. This course is designed to provide the student knowledge and skills that relate to single subject research methodology in special education. It includes an overview of historical and philosophical foundations, basic issues in behavioral assessment, and single subject research design and methodology, including trend and statistical analysis in single subject research. Students will analyze critically empirical research and be able to plan, implement, and evaluate original research conducted with children and youth.

ESSE 735/835. Connecting Research In Early Developmental Practice in Early Childhood Education. Lecture 3 hours; 3 credits. This seminar will explore philosophical orientations toward early childhood education, current research in the field, and the implication of this research for policy and practice. Students will focus on research within a community of practice orientation by linking current research and policy to current practices and issues in the field.

ESSE 736/836. Working with At-Risk Children and Families: An Ecological Approach. Lecture 3 hours; 3 credits. The influence of the home, the community and classroom on the achievement of at-risk children is examined. Successful teaching strategies and behavioral interventions also are discussed as well as the need to search for viable alternatives to strategies of past school reforms.

ESSE 737/837. Schools and Families: Enriching the Partnership. Lecture 3 hours; 3 credits. A critical examination and analysis of current trends in education as they affect the family and school will be addressed. Emphasis will be

placed on the need for parent involvement and support in the child's education.

ESSE 739/839. Cross Cultural Perspectives in Early Childhood Education. Lecture 3 hours; 3 credits. This course will address the socialization process as a component of the broad perspective of a child's life. Curriculum development and how it is affected by the cultural context of an educational system will be discussed, as well as the impact of current trends on research and pedagogy in early childhood education.

ESSE 740/840. Issues in Early Childhood Language and Literacy. Lecture 3 hours; 3 credits. This course follows a theory into practice philosophy, examining language acquisition and early literacy teaching practice and learning. Students examine, develop and use advanced instructional strategies, materials, technologies, and activities to promote language and literacy development. The impact of formative assessment on instruction and curricular decision-making as well as cultural, social, familial, and multilingual issues will be addressed.

ESSE 772/872. Advanced Developmental Process. Lecture 3 hours; 3 credits. This course is designed to examine the theoretical basis for alternative views of the nature of human development. Students' understanding of topical areas in child development will be enhanced through an examination of current research in child development and relevant findings from cross-cultural study.

ESSE 774/874. Constructivist Teaching. Lecture 3 hours; 3 credits. This course addresses Piaget's theory of cognitive and moral developments. Students will learn techniques for studying the behavior and development of young children. Analysis of constructivist research, replicated empirical work, and implications for planning learning environments and education programs for young children will be emphasized.

ESSE 795/895. Topics in Education. Lecture 1-3 hours; 1-3 credits each semester. Prerequisite: permission of instructor. The advanced study of selected topics and emergent research related issues that permits small groups of qualified students to study subjects of mutual interest, which, due to their specialized nature, may not be offered regularly.

ESSE 821. Critical Issues I: Readings in Special Education and Professional Writing. Lecture 3 hours; 3 credits. The intent of this course is to provide doctoral candidates an opportunity to do the following: (a) become thoroughly involved in the literature relating to current critical issues in special education and (b) begin the process of developing writing skills suitable for positions and tenure in higher education. The course stresses APA writing guidelines and style, conducting literature searches, and beginning development of a writing product that is suitable for publication. The course provides an introduction to the skills necessary for advancement in higher education and professional institutions.

ESSE 822. Critical Issues II: Research and Professional Writing. Lecture 3 hours; 3 credits. Prerequisite: ESSE 821. This course provides doctoral candidates an opportunity to read, analyze and synthesize research in special education with the intent to contributing to the literature. The course emphasizes skills necessary for developing writing skills suitable for positions and tenure in higher education. APA writing guidelines and style, analyzing and synthesizing research/literature, and producing a lengthy written product suitable for publication are stressed. The

course is designed to build skills necessary for advancement in higher education and professional institutions.

ESSE 868. Internship: Urban Child Study/Special Education. 3 credits. This course provides doctoral students an opportunity to gain practicum experience in human service agencies, in educational settings in urban school administration, and in other community education training projects.

ESSE 869. Practicum/Field Experience. 6-12 credits. Supervised involvement of the doctoral-level student in a practicum setting, where the student and the instructor work together closely to develop curriculum and gain expertise in teaching specific topics of importance to early childhood educators. A weekly seminar is required.

ESSE 893. Professional Seminar: Teaching, Research, and Service. Lecture 3 hours; 3 credits. Prerequisites: ESSE 821 and 822. This course prepares doctoral candidates to meet professional standards in teaching, research and service in special education in higher education institutions. Teaching includes an understanding of adult learning and the design, delivery, evaluation of content, and use of technology in college teaching. Research includes recognizing and critically discussing scholarly work, systematically planning and preparing for research, and developing research proposals. Service includes identifying professional organizations and agencies and creating integrated professional development programs. The course is designed to build skills necessary for advancement in higher education and professional institutions.

ESSE 899. Dissertation. 1-12 credits. Prerequisite: Completion of candidacy examination.

ESSE 999. Early Childhood/Special Education 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Educational Curriculum and Instruction — ECI

ECI 406/506. Teaching in the Multicultural Classroom. Lecture 3 hours; 3 credits. Prerequisite: junior standing. Explores the teaching strategies, materials and understandings needed in developing responsive classroom environments for children from diverse cultural, ethnic, economic and linguistic backgrounds.

ECI 430/530. PK-12 Instructional Technology. Lecture 3 hours; 3 credits. Prerequisite: functional competency using productivity software such as word processing, spreadsheet, presentation and the internet. Based on national and state technology standards, students will utilize contemporary productivity tools and internet resources to understand and apply a broad spectrum of instructional technology tools and associated, research-based instructional strategies to enhance the teaching/learning process. ECI 530 students will complete a research paper. Upon course completion, all students should be able to pass, or be exempt from, their school district's TSIP requirements.

ECI 432/532. Developing Instructional Strategies PreK-6: Language Arts. Lecture 3 hours; 3 credits. Prerequisites: ECI 301 or 290, 430/530 and ECI 468/568. Following a theory into

practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote children's development of attitudes, behaviors, and concepts in language arts in grades PreK-6 in support of NCTE national instructional standards and the Virginia Standards of Learning.

ECI 433/533. Developing Instructional Strategies PreK-6: Mathematics. Lecture 3 hours; 3 credits. Prerequisites: ECI 301 or 290 and 430/530. Following a theory into practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote children's development of attitudes, behaviors, and concepts in mathematics in grades PreK-6 in support of NCTM national instructional standards and the Virginia Standards of Learning.

ECI 434/534. Developing Instructional Strategies PreK-6: Science. Lecture 3 hours; 3 credits. Prerequisites: ECI 301 or 290 and 430/530. Following a theory into practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote children's development of attitudes, behaviors, and concepts in science in grades PreK-6 in support of AAAS national instructional standards and the Virginia Standards of Learning.

ECI 435/535. Developing Instructional Strategies PreK-6: Social Studies. Lecture 3 hours; 3 credits. Prerequisites: ECI 301 or 290 and 430/530. Following a theory into practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote children's development of attitudes, behaviors, and concepts in social studies in grades PreK-6 in support of NCSS national instructional standards and the Virginia Standards of Learning.

ECI 451/551. Developing Instructional Strategies for Teaching in the Middle/High School: English. Lecture 3 credits. 3 credits. Corequisite: ECI 483. Prerequisites: ECI 301 or 290, 430/530, ESSE 313 or 677, passing scores on PRAXIS I or equivalent SAT scores as established by VA State Board of Education, acceptance into teacher education, no grade less than C- in content area and professional education core, minimum major and overall GPA of at least 2.75. Following a theory/research-into-practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote the development of attitudes, behaviors, and concepts in English, grades 6-12, informed by national instructional standards and the Virginia Standards of Learning; 35 hours of teaching practicum required. (Additional prerequisites for MCTP students are ECI 608 and 616.)

ECI 453/553. Developing Instructional Strategies for Teaching in the Middle/High School: Mathematics. Lecture 3 hours; 3 credits. Corequisite: ECI 483. Prerequisites: ECI 301 or 290, 430/530, ESSE 313 or 677, passing scores on PRAXIS I or equivalent SAT scores as established by VA State Board of Education, acceptance into teacher education, no grade less than C- in content area and professional education core, minimum major and overall GPA of at least 2.75. Following a theory/research-into-practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote the development of attitudes, behaviors, and concepts in mathematics, grades 6-12, in support of national instructional standards and the Virginia Standards of Learning; 35 hours of

* See Practicum Experience Policy in Catalog.

teaching practicum required. (Additional prerequisites for MCTP students are ECI 608 and 616.)

ECI 454/554. Developing Instructional Strategies for Teaching in the Middle/High School: Science. Lecture 3 hours; 3 credits. Corequisite: ECI 483. Prerequisites: ECI 301 or 290 and 430/530, ESSE 313 or 677, passing scores on PRAXIS I or equivalent SAT scores as established by VA State Board of Education, acceptance into teacher education, no grade less than C- in content area and professional education core, minimum major and overall GPA of at least 2.75. Following a theory/research-into-practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote the development of attitudes, behaviors, and concepts in science, grades 6-12, informed by national instructional standards and the Virginia Standards of Learning; 35 hours of teaching practicum required. (Additional prerequisites for MCTP students are ECI 608 and 616.)

ECI 455/555. Developing Instructional Strategies for Teaching in the Middle/High School: Social Studies. Lecture 3 hours; 3 credits. Corequisite: ECI 483. Prerequisites: ECI 301 or 290, 430/530, ESSE 313 or 677, passing scores on PRAXIS I or equivalent SAT scores as established by VA State Board of Education, acceptance into teacher education, no grade less than C- in content area and professional education core, minimum major and overall GPA of at least 2.75. Following a theory/research-into-practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote the development of attitudes, behaviors, and concepts in social studies, grades 6-12, informed by national instructional standards and the Virginia Standards of Learning; 35 hours of teaching practicum required. (Additional prerequisites for MCTP students are ECI 608 and 616.)

ECI 468/568. Language Acquisition and Reading for Students with Diverse Learning Needs. Lecture 3 hours; 3 credits. Prerequisite: junior standing. This course provides an overview of normal language development and language disorders which impact the acquisition of language based curriculum skills such as listening, speaking, reading, and written expression. Emphasis is on instructional techniques to assist individuals with disabilities achieve reading and comprehension skills. Effective reading strategies and curricula for individuals with disabilities will also be reviewed.

ECI 483/583. Practicum Seminar in Education. Lecture 1 hour; 1 credit. Corequisite: ECI 451/551 or 453/553 or 454/554 or 455/555. Prerequisites: ECI 301 or 290, ECI 430/530, ESSE 313 or 677. Explores issues, problems, concerns, and processes related to teaching and to entering the profession of teaching. Passing score on PRAXIS II in licensure content area is required.

ECI 486/586. Student Teaching for Special Endorsement. Five days per week; 7-8 weeks; 3-6 credits. Prerequisites: Collegiate Professional Certificate and/or completion of an approved program in teacher education, successful completion of exit writing examination, passing scores on PRAXIS I or equivalent SAT or ACT scores as established by VA State Board of Education, passing scores on the appropriate PRAXIS II content examination, departmental approval, permission of the director of teacher education services, no grade less than C- in content

area and professional education core, minimum major and overall GPA of at least 2.75. Available for pass/fail grading only. Internship in school. (qualifies as a CAP experience)

ECI 495/595. Topics in Education. Lecture 1-4 hours; 1-4 credits. Prerequisite: junior or graduate standing. Explores contemporary problems and trends in education. Emphasis is placed upon topics related to curriculum, instructional strategies, and evaluation.

ECI 496/596. Topics in Education. Lecture 1-3 hours; 1-3 credits. Prerequisite: junior or graduate standing. Cannot be applied to a Master of Science in Education degree in the Department of Educational Curriculum and Instruction. Explores contemporary problems and trends in education. Emphasis is placed upon topics related to curriculum, instructional strategies, and evaluation.

ECI 497/597, 498/598. Topics in Education. Hours to be arranged: 1-3 credits. Prerequisite: junior or graduate standing. Allows the student to engage in independent study of issues and trends in education. Emphasis is placed upon topics related to curriculum, instructional strategies, and evaluation.

ECI 608. Foundations of Education and Instructional Assessment. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Provides students with an understanding of historical, philosophical, economic, and sociological issues in American education, their effect on student achievement, and the impact of social change on existing institutions. Includes the development of instruction based on assessment data including the use, construction, interpretation, and analysis of valid assessments. (Students are required to complete a 30 hour observation/participation experience in an appropriate PreK-12 setting)

ECI 615. Teaching in the Middle School. Lecture 4 hours; 4 credits. Prerequisite: graduate standing. Focusing on middle school teaching, this course examines the organization, curriculum, instructional strategies, classroom management techniques, and teaching methods for working with young adolescents. Also covered are middle school guidance, exploratories, scheduling, and parent-school relations. A 30 hour practicum in a middle school is required.

ECI 616. Design for Effective Instruction. Lecture 3 hours; 3 credits. Assists students in the organization of research on effective teaching for application in diversified classroom settings. Decision-making in the areas of content, learner behavior, and teacher behavior is stressed. Students learn the fundamentals of lesson design and basic instruction through a unit plan project and teaching vignettes.

ECI 618. Approaches to Teaching Literature and Writing K-12. Lecture 3 hours; 3 credits. Explores the theory and practice of teaching literature, including young adult and children's literature, and writing. Considers some of the characteristics of writing processes, the role of the teacher in structuring and responding to student writing, the role of the teacher in literary text selection, the relationships between writing and literary understanding, and the authentic assessment of K-12 students' reading, writing and learning. Helps students improve the clarity and power of their own prose.

ECI 619. Classroom Research and Assessment in Curriculum and Instruction. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Students admitted to elementary/middle school education prior to July 1, 2000 must take

this course with either ECI 667 or ECI 669. Students will learn research techniques such as designs and data collection by conducting their own research studies with pupils in grades K-12. Measurement and evaluation principles and procedures for assessing and promoting children's learning and development will be addressed as will the interpretation of standardized tests.

ECI 620. Multicultural Children's Literature and Literacy. Lecture 3 hours; 3 credits. Provides for the examination, evaluation, and use of multicultural library materials and resources for elementary and middle school children.

ECI 621. Differentiated Literacy Instruction and Portfolio Development. Lecture 3 hours; 3 credits. Prerequisites: 15 graduate hours in reading. Instruction in ways to differentiate instruction in literacy for students of differing abilities, levels, and diverse learning needs. Research-based frameworks and plans for differentiation as well as practical strategies will be emphasized.

ECI 634. Microcomputer Hardware Systems in Education. Lecture 3 hours; 3 credits. Provides a broad overview of PC and Mac desktop computer hardware and software, including maintenance, troubleshooting, upgrading, operating systems, configuration management, software installation, and basics of networking. Laboratory experiences provide direct application of skills.

ECI 635. Research Methods in Education. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Examines types of educational research and criteria for selection of topics for research projects; describes criteria for effective collection and organization of data, review of literature, analysis of data, and research and proposal writing. This course is a prerequisite for ECI 636, 637, 639, 698, 699.

ECI 636. Problems in Education. Hours to be arranged; 3 credits. Prerequisite: ECI 635. Provides practice in the use of quantitative or qualitative techniques, including analytical processes, in solving problems in education. (Available for pass/fail grading only)

ECI 637. Problems in Reading Education. Lecture 3 hours; 3 credits. Prerequisites: ECI 635 and 15 graduate hours in reading. Presents an overview of current reading research and its application to instruction. Provides study and practice in the use of quantitative or qualitative techniques, including analytical processes, in solving problems in reading education.

ECI 638. Dynamic Assessment of Teaching and Learning. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. In this first course in the Field Based Graduate Program, students conduct an extensive qualitative and/or quantitative assessment of the teaching/learning dynamic in K-12 school settings. The assessment will include school culture, student demographics, curriculum, instructional practices, technology, and other critical components of teaching and learning. Analysis of the assessment will result in a document that emphasizes a professional development plan.

ECI 639. Seminar in Education. Hours to be arranged; 3 credits. Prerequisite: 15 hours in graduate education, including all core courses. Explores in depth a variety of current topics, trends and concerns in K-12 education.

ECI 640. The Management of Learning and Instruction. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Explores

problems and develops individual projects in many aspects of education and describes learners—how they learn and how teachers can facilitate their learning.

ECI 648. Digital Media for Educators. Lecture 3 hours; 3 credits. Course surveys a variety of tools, techniques and technologies, as well as strategies and common practices in the design and development of digital learning products using contemporary software such as Acrobat, Flash, Graphic Converter along with standard productivity tools. Students will gain hands-on experience in the creation of digital media elements suitable for use in traditional and distributed learning environments. Includes design and technical considerations of graphics manipulation and design, sound and video elements, and animation.

ECI 652. Language Arts in the Elementary/Middle School. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Examines the teaching of oral and written expression, reading, spelling, and handwriting and describes conditions necessary for children's optimum development in the language arts.

ECI 653. Mathematics in the Elementary/Middle School. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Presents an overview of the content and structure of the various mathematics curricula. Methods of teaching mathematics in the elementary and middle school are introduced with special emphasis on technology in the mathematics classroom.

ECI 654. Science in the Elementary/Middle School. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Current developments and educational research are applied to instructional methodology with an emphasis on hands-on activities in the school science curriculum.

ECI 655. Social Studies in the Elementary/Middle School. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Includes advanced preparation of instructional objectives, evaluation procedures, instructional resources, classroom activities, and lesson development, and describes current social studies curriculum projects as well as current trends in the teaching of social studies.

ECI 656. Developing Instructional Strategies for Elementary Education. Lecture 3 hours; 3 credits. For MCTP students only. Prerequisite: graduate standing. This course will focus on the selection of appropriate skills and objectives students require in their learning. Emphasis will be on how to determine which concepts should be taught and on which method/methods best suit both the objectives and the student. Information from previous courses will be taken to the next level of difficulty (i.e. task analysis, sequencing of objectives, and unit planning).

ECI 657. Language Arts Methods for Middle and Secondary School. Lecture 3 hours; 3 credits. For MCTP students only. Prerequisite: graduate standing. This course is designed to teach prospective educators the components of language arts. Particular emphasis will be placed on analyzing the standards of learning for both disciplines, and the planning, development, and implementation of interdisciplinary units of study for middle and secondary school students.

ECI 658. Math Methods for Middle and Secondary School. Lecture 3 hours; 3 credits. For MCTP students only. Prerequisite: graduate standing. Course will explore the basic building blocks necessary to develop effective teaching skills in the mathematics classroom. These skills,

including a thorough knowledge of the appropriate level of content, relevancy, pedagogy-based research on how learning takes place, opportunities to use writing and reading techniques, manipulative tools, technology, and other resources vital to creating a learning community in the classroom, will be emphasized in academic discussion, observation and application. Exploration of effective, research-based mathematical teaching methodology and evaluation standards. Emphasis placed on strategies including cooperative learning, technology, manipulatives, cultural influences and cross content teaching strategies.

ECI 659. Science Methods for Middle and Secondary School. Lecture 3 hours; 3 credits. For MCTP students only. Prerequisite: graduate standing. This course is designed to give prospective science teachers practical applications of current science instructional theories. The student will engage in the investigative nature of science through the exploration of philosophies, the use of research, laboratory experimentation, interactive technology, instructional methods, and assessment/evaluation techniques.

ECI 662. Social Studies Methods for Middle and Secondary School. Lecture 3 hours; 3 credits. For MCTP students only. Prerequisite: graduate standing. Course will provide pre-service teachers the opportunity to learn and make application of teaching methodologies appropriate for the secondary and middle school classrooms. Embracing the purpose of the social studies, the course will emphasize the integrated study of the social sciences and humanities, drawing upon such disciplines as anthropology, archaeology, economics, geography, history, law, philosophy, political science, psychology, religion, and sociology, as well as appropriate content from the humanities, mathematics, and the natural sciences.

ECI 665. Digital Video Materials Development. Lecture 3 hours; 3 credits. Design, development, and production of digital video and the use of video as an instructional component. Students will utilize teaching and learning theory to determine the effective use of video, and how to create video segments to enhance the understanding of appropriate knowledge chunks. In addition, technical aspects of digital media delivery in contemporary transmission systems will be explored.

ECI 666. Internship/Student Teaching and Seminar. Five days per week for 14 weeks; 9 credits. Prerequisites: completion of an approved program in teacher education, 6-8, passing scores on PRAXIS I or equivalent SAT or ACT scores as established by VA State Board of Education, passing scores on the appropriate PRAXIS II content examination, departmental approval, permission of the director of teacher education services, no grade less than C- in content area and professional education core, minimum major and overall GPA of at least 2.75. Available for pass/fail grading only. Provides practice in teaching in grades 6-8 and in analyzing teaching approaches and behaviors. Examines instructional problems and concerns.

ECI 668. Internship/Student Teaching and Seminar. Five days per week for 14 weeks; 9 credits. Prerequisites: completion of an approved program in teacher education PreK-6, passing scores on PRAXIS I or equivalent SAT or ACT scores as established by VA State Board of Education, passing scores on the appropriate PRAXIS II content examination, departmental approval, permission of the director of teacher

education services, no grade less than C- in content area and professional education core, minimum major and overall GPA of at least 2.75. Available for pass/fail grading only. Provides practice in teaching in grades PK-6 and in analyzing teaching approaches and behaviors. Examines instructional problems and concerns.

ECI 669. Internship/Student Teaching and Seminar. Five days per week for 6-14 weeks; 3-9 credits. Prerequisite: Completion of an approved program in teacher education, passing scores on the appropriate licensure assessments, departmental approval, permission of the director of teacher education services, no grade less than C- in content area and professional education core, minimum major and overall GPA of at least 2.75, GPA of 3.0 required for graduate programs. Available for pass/fail grading only. Provides practice in teaching and in analyzing teaching approaches and behaviors. Examines instructional problems and concerns.

ECI 670. Capstone in Research, Evaluation, and Application in Instructional Technology. Lecture 3 hours; 3 credits. Students will design a three-chapter research proposal and study the appropriate statistical references. Evaluation methodologies leading to this research are explored (portfolio/rubrics). Instructional technology and its classroom applications are interwoven into research and evaluation.

ECI 680. Reading to Learn Across the Curriculum. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. This class has an emphasis on reading strategies for classroom teachers and reading specialists. Students develop an understanding of the process of reading to learn across the curriculum including a wide variety of comprehension strategies and an understanding of the complex nature of reading throughout the disciplines. Lecture, demonstrations, development of materials, and practice in the techniques of reading for elementary and secondary classroom teachers and library media specialists are provided.

ECI 683. Diagnostic Teaching of Reading in the Classroom. Lecture 3 hours; 3 credits. Prerequisite: graduate standing and ECI 468/568 or equivalent. Provides classroom teachers with strategies/techniques to employ to ongoing diagnosis and remediation through the use of informal and standardized tests to select appropriate instructional strategies for pupils' existing reading capabilities.

ECI 685. Organizing and Supervising Reading Program Development. Lecture 3 hours; 3 credits. Prerequisite: 9 graduate hours in reading. Presents an overview of the total school reading program (K-12), and not only prepares the prospective reading supervisor to make decisions pertaining to the procurement of materials for the program but also explores models for integrating reading into the general curriculum.

ECI 686. Advanced Language Development and Reading. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Explores current theories of cognitive development and their relationship to language development and reading as bases for evaluating methods and materials of teaching reading and the related communicative arts: spelling, writing, and speaking.

ECI 689. Survey of Reading Instruction. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Surveys the linguistic, psychological, sociological, philosophical, and historical foundations of current reading pedagogy.

ECI 693. Practicum in Reading. Hours to be arranged; 3 credits. Prerequisite: 15 hours in graduate reading to include ECI 683 and permission of the instructor. This course provides graduate teachers with opportunities to practice and further refine their understandings of the reading process in clinical and classroom settings. Teachers provide both individual and group reading lessons with students from the local community. Advanced diagnostic tests of learning processes and intellectual capacity are covered. These advanced diagnostic techniques are in addition to those covered in the initial diagnostic reading course.

ECI 695. Topics in Education. Lecture 1-3 hours; 1-3 credits. Prerequisite: graduate standing. Provides opportunities for graduate students to explore current topics, trends and issues related to curriculum, instructional strategies, and evaluation.

ECI 697. Topics in Secondary School Instruction. Lecture 1-3 hours; 1-3 credits. Prerequisite: graduate standing. Provides offerings in several content areas to meet the needs of graduate students in secondary education.

ECI 698, 699. Thesis. 6 credits. Prerequisites: graduate standing and permission of the instructor. Master's-level research and thesis in topics related to curriculum, instructional strategies, and evaluation in educational settings.

ECI 701/801. Seminar in Education: Theories of Learning and Instruction. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Provides an overview and investigation of theories of learning and models of teaching.

ECI 721/821. Advanced Curriculum Design and Development. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Focuses on the process of building a curriculum, historical developments in curriculum design, alternative curricula, current and future trends in curricular innovations, and research in curriculum development.

ECI 722/822. Curriculum Seminar in Content Areas. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Investigates the role and nature of the curriculum for particular subject-matter specialties — e.g., math, social studies, science, English, school librarianship, reading, etc. Objectives are tailored to specific content areas.

ECI 724/824. Readings in Contemporary Society. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Surveys the literature related to the issues and trends in contemporary society and provides educators with a substantive base in the philosophy, history, theory, strategies and multicultural perspectives relevant to curriculum development.

ECI 726/826. Advanced Supervision of Reading Programs. Lecture 3 hours; 3 credits. Prerequisites: ECI 693. Explores various models of supervision and relates them to the administration and supervision of reading programs. Also prepares the prospective administrator/supervisor to make decisions relative to the methods and materials used to teach reading.

ECI 727/827. Advanced Practicum in Reading. 3 credits. Prerequisite: ECI 693. This course is designed for teachers having completed the initial reading practicum. Its focus is on the refinement and further exploration of ways to work with students experiencing reading difficulties. Both group and individual tutoring experiences will be provided. Ways will be explored to encourage involvement in existing educational programs and schools.

ECI 728/828. Contemporary Issues in Literacy Research. Lecture 3 hours; 3 credits. Prerequisite: M.S.Ed. in Reading Education. Directed study of current topics of interest to students involved in literacy research. Topics to include emergent literacy assessment, adult literacy programs, and other areas of investigation. Students will be required to prepare a scholarly paper reporting results for publication.

ECI 731/831. Instructional Technology Trends in Curriculum and Instruction. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Examines selected issues and trends involving the use of technology in curriculum and instruction. Students develop a critical awareness of contemporary technology, an understanding of current research regarding the successful implementation of technology in curriculum and instruction, and strategies for using new technology in the future.

ECI 732/832. Visual Communication and Design for Instructional Environments. Lecture 3 hours; 3 credits. Course focuses on visual literacy and the language of graphics. Students will learn to design visual messages, including text, graphics, and data displays. The theoretical underpinnings of various communications media and their efficacy in instructional environments will be studied and applied through graphics, textual, and multimedia software and components.

ECI 735/835. Technology and the Management of Curriculum and Instruction. Lecture 3 hours; 3 credits. Surveys computing and telecommunication technology and issues, with a focus on technical, budgetary, social, reform and regulatory trends in educational settings. Purchase and implementation issues will be included to enhance management and decision-making.

ECI 737. Managing Distance Learning Networks. Lecture 3 hours; 3 credits. Students will explore the development of policies and procedures that lead to the successful management of a distance learning initiative. Training and supporting faculty to utilize the technology, workload considerations, and support of the student at a distance will be the major focus of the course. Topics will include human resources issues such as hiring and supervising distance learning staff, and support issues such as admission and registration, financial aid, testing, assessment and evaluation, and instructional material access. In addition, marketing strategies will be discussed and the costs for operating a distance learning network covered.

ECI 740/840. Critical Issues in Curriculum. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Explores the relationship between the historical, philosophical, and sociopolitical influences on curriculum development and evaluation. Historical and cultural approaches to designing and implementing curricular models, curriculum reform, and understanding the politics of conceptualizing the curriculum process are highlighted. An examination of major issues concerning educational curriculum reform are addressed and reviewed.

ECI 741/841. Change Issues in Curriculum and Instruction. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Explores questions and issues related to the evolving nature of curriculum and instruction and the design of the contemporary curriculum. Through readings and projects, students will examine new discoveries in research and technology, the effect of these and other changes on education, and the challenges of life-long learning as an influence on change.

ECI 748/848. Assessment and Evaluation in Content Areas. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Overview of educational evaluation practices and methods. The design of an evaluation study and an educational report assessment of ethical considerations and impact of various assessment and evaluation processes for instructional and supervisory personnel. This course will be about assessment and measurement with an emphasis on psychometrics (This is not a program evaluation course)

ECI 752/852. Curriculum Problems in Urban Schools and Society. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Studies major curriculum problems and issues in urban education today and discusses how the changing urban environment affects curriculum planning and decision making.

ECI 877. Program Evaluation in Education. Lecture 3 hours; 3 credits. Prerequisite: ECI 635 or equivalent. Examines procedures and problems in the design and utilization of program evaluation in education. Identifies evaluation purposes and the methods of evaluation especially as affected by organizational behavior, ethical considerations, and political influences. Evaluation methodology includes but is not limited to design considerations, data utilization, and teacher evaluation. Both quantitative and qualitative strategies will be covered.

ECI 788/888. Seminar in the Multicultural Environment. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Explores topics related to the cultural characteristics of ethnically diverse populations and how these diverse populations and characteristics interact with social, political and economic institutions and the dominant culture to create the contemporary environment.

ECI 790/890. Qualitative Research Design. Lecture 3 hours; 3 credits. Prerequisite: ECI 635 or equivalent. Covers basic characteristics of qualitative research; identification of ways to collect and analyze qualitative research; examination of ethical issues; development of proposals; and writing up studies.

ECI 795/895. Topics in Education. Lecture 1-3 hours; 1-3 credits. Prerequisite: graduate standing. Provides opportunities for doctoral students to explore topics related to curriculum, instructional strategies, and evaluation.

ECI 797/897. Independent Study. Hours to be arranged; 1-3 credits. Prerequisite: graduate standing. Provides opportunities for the doctoral student to do independent research in an area of his/her particular interests and needs.

ECI 891. Dissertation Seminar. Lecture 3 hours; 3 credits. This seminar helps ECI doctoral students develop their skills and knowledge about the research process and assists them in developing a dissertation proposal. Students engage in debate and critique their oral and written dissertation proposals. Successful completion of the class does not guarantee a successful dissertation proposal. Dissertation proposals are approved by the student's dissertation committee.

ECI 899. Dissertation. 1-12 credits. Prerequisites: graduate standing, successful completion of candidacy exam and permission of the instructor.

ECI 999. Educational Curriculum and Instruction. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the

candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Educational Leadership and Services — ELS

ELS 497/597, 498/598. Topics in Education. 1-3 credits each semester. Prerequisite: permission of the instructor. The College of Education offers selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly.

ELS 600. Principal Orientation and Instructional Leadership. Lecture 3 hours; 3 credits. An introduction to educational leadership to develop a capacity for reflective practice which unifies theory and knowledge for the improvement of instruction. Students will begin to understand their leadership potential through reflection, self-analysis, and instructor feedback via diagnostic assessment and case studies for principals. Students develop an administrative portfolio skills assessment. Required entry level course.

ELS 610. School Community Relations and Politics. Lecture 3 hours; 3 credits. Prerequisite: ELS 600. An introduction for prospective administrators to the social, political context in which they work. Emphasis will be placed on: understanding and using leadership skills in designing programs around the needs and problems of the school and its special publics; relating with the media; improving communication skills; and using skills in negotiations and conflict management.

ELS 611. Advanced Educational Psychology. Seminar 3 hours; 3 credits. A study of the elements of human motivation, learning and mental health techniques in various learning environments. A thematic approach is utilized to guide individual and group activities. Primary focus is upon improving one's understanding of affective and cognitive functioning, management skills, and mental health practices to enhance personal delivery and supervisory skills as a human service provider.

ELS 615. Advanced Human Development. Lecture 3 hours; 3 credits. The study of human development from the prenatal origin to adulthood. An interdisciplinary approach involving the psychological, biological, sociological and the educational facets of life and their impact upon the individual. Essential informational systems are discussed.

ELS 621. Curriculum Development and Assessment. Lecture 3 hours; 3 credits. Prerequisite: ELS 600. A course designed to create a basic understanding of the comprehensive nature of the curriculum development process K-12, from a school leadership perspective. Students will explore theoretical, strategic, and organizational issues associated with curriculum development including multiculturalism, cognitive development, curricular patterns and connections, and assessment and evaluation.

ELS 626. Instructional Supervision, Staff Development, and Assessment. Lecture 3 hours; 3 credits. Prerequisites: ELS 600, 610, and 621. Through site-based projects, scripts, enactments, case study analysis, and reflection, course participants apply theories and best practices to develop the skills and strategies that leaders use with individuals and groups to facilitate excellence in teaching and learning.

ELS 657. Public School Law. Lecture 3 hours; 3 credits. Prerequisite: ELS 600. This course is an introduction to law, particularly with

respect to federal and state statutes and court decisions dealing with the public schools. The topics span the full spectrum of law-related concerns. By necessity, it is first a theoretical course; however, the outcomes are intended to be practical by providing the legal understanding necessary for a school administrator to negotiate his or her way through the maze of difficult legal matters commonly faced each day by school and district leaders.

ELS 660. Program Evaluation, Research and Planning. Lecture 3 hours; 3 credits. Prerequisite: ELS 600. In this course principal licensure candidates learn to identify organizational needs, develop research-based strategies to address those needs, and use data-driven planning to implement, monitor, and manage processes involved in implementing change strategies.

ELS 668. Internship in Educational Leadership. 3-6 credits. Prerequisites: ELS 600, 669, passing scores on the appropriate PRAXIS II content examination or permission of instructor. The university and site supervisor will work with the educational leadership candidate in PreK through 12 and central office settings to provide the candidate with appropriate experiences to demonstrate competencies required by the Educational Leadership Constituent Council and the Virginia Department of Education.

ELS 669. Instructional Internship. Title credits 20 hrs; 3 credits. Prerequisite: ELS 673. Each internship course will require students to complete a minimum of 160 hours in each course. Course is designed to provide field experiences which will prepare them to serve as instructional and curriculum leadership in K-12 environments. Student must produce 1) a portfolio with required artifacts; 2) prepare a 10-12 reflective paper according to identified guidelines and 3) complete internship evaluation with mentor and college supervisor at least three times during the term.

ELS 673. Critical Issues Research. Lecture 3 hours; 3 credits. Prerequisites: ELS 600, 610, 621, 626, and 660. The student completes an in-depth study of a critical issue in his/her profession and documents the work in a critical issue paper. Student must be able to demonstrate written and oral communication skills and critical and analytical skills in dealing with a major issue in educational leadership. Course to be taken near completion of program.

ELS 697. Topics in Educational Leadership. 1-6 credits. The study of selected topics in educational leadership. Arranged individually with students.

ELS 698-699. Thesis. 3-6 credits. Prerequisite: permission of advisor. Research and writing of the master's thesis and scheduled conferences with the candidate's advisor.

ELS 732. Statistics Applied to Research in Education and Human Services I. Lecture 3 hours; 3 credits. This course focuses on how inferential statistics and multivariate analysis is used in the analysis of educational and human services research.

ELS 753/853. Public School Finance. Lecture 3 hours; 3 credits. Prerequisites: ELS 600 and 610. This course includes the study of the way today's public schools are financed, including an analysis of the sources of revenues, the distribution of revenue, and the budgeting and expenditure of revenue. Students will learn the fiscal management skills and understandings necessary to manage the finances of a school or school system, including the study of system and school procedures related to budget planning, budget

management, and purchasing procedures. Students will learn how investment in education develops human capital.

ELS 754/854. Human Resource Development and Evaluation. Lecture 3 hours; 3 credits. Prerequisite: ELS 600. This course focuses on the development of various staff personnel functions. Collaborative staff development and performance evaluation are linked to organizational goals, culture and learner achievement. Application of knowledge and skills via case study, simulation and oral and written demonstration projects is included.

ELS 755. Political Systems, Legislation and Urban Education. Lecture 3 hours; 3 credits. An advanced doctoral seminar relating and applying urban educational leadership styles to state political environments. Analyzes state and federal legislative structures as they impact on educational policy formulation.

ELS 760. Computer Applications in Educational Administration and Supervision. Lecture 3 hours; 3 credits. Study of the impact, design, application and evaluation of computer competencies required of school administrators. Includes items such as computer application in scheduling, staffing and attendance, design of comprehensive plans for district use and other related issues.

ELS 764/864. History and Philosophy of American Public School Reform. Lecture 3 hours; 3 credits. This course covers the major historical movements, especially in school reform, and key American educational philosophers. This course will provide prospective school administrators with a historical and philosophical foundation of education.

ELS 783/883. Contemporary Issues in Education. Lecture 3 hours; 3 credits. This course is a survey of current issues in education, as well as the political, financial, and social issues affecting education leadership. The course will explore relationships between current issues, historical perspectives, philosophical theories, and sociologic influences. The exploration of contemporary issues related to equity and achievement will serve as a critical component of the class.

ELS 787/887. Pupil Personnel Services for Diverse Populations. Lecture 3 hours; 3 credits. Prerequisite: ELS 600. This course focuses on the theories and skills that leaders need in order to administer the broad array of special services (i.e., special education, bilingual programming, counseling, and psychological, social work, and therapy services) so that students with all diverse needs are included in regular education.

ELS 795/895. Topics in Educational Leadership. 1-3 credits. Prerequisite: permission of the instructor.

ELS 806. The Urban System. Lecture 3 hours; 3 credits. Prerequisite: permission of the graduate program director. Introduces students to the discipline of urban studies by focusing on various aspects of the city and cultural diversity. Provides an interdisciplinary overview of economic development and redevelopment, environmental factors, educational systems, health care systems, and government systems. Examines the extent to which urban systems impact diverse residents' lives.

ELS 811. Leadership Theory for Educational Improvement. Lecture 3 hours; 3 credits. This course provides the necessary knowledge to become an integral part of the educational improvement process at the school, division, and state levels. Students will analyze

and relate the significant educational trends of the past 20 years to the political process, analyzing the impact on school planning. Students will take an active and vocal role in the discourse and debate about educational policy and practice. Emphasis will be placed on analyzing the context and implementing planning systems to develop mission, goals and programs that result in educational improvement.

ELS 815. Leadership for Equity and Inclusive Education. Lecture 3 hours; 3 credits. This course focuses on the theories and practices that help educational leaders ensure that students with special needs receive an equitable and inclusive education. Emphasis is on perspectives of difference versus deviance, historical foundations of specialized programs, current social and legal contexts that influence programming, questions of social justice, and possibilities for the inclusion of all students. While this course addresses the needs of all students, concentration is on individuals with disabilities and the laws that safeguard their rights.

ELS 821. Policy and Politics in Educational Leadership. Lecture 3 hours; 3 credits. Prerequisite: ELS 811. This course focuses on the theories and practices needed to build relationships and support from the state political process, the local community, businesses, and media. Emphasis will be placed on the use of influence, and its impact on relationships, policies, and programs. Focus is placed on developing a shared vision to bring schools and communities together as partners in improving student learning. Two-way communication mechanisms for school improvement using political influence and power are examined.

ELS 831. Accountability Systems in Public Education. Lecture 3 hours; 3 credits. Prerequisites: ELS 660, 732 and 880. This course addresses the design, development, implementation, and alignment of public education accountability systems at the federal, state, and local levels. Particular attention is given to how the design and implementation of accountability systems affects educational equity and school reform efforts.

ELS 832. Statistics Applied to Research in Education and Human Services II. Lecture 3 hours; 3 credits. Prerequisite: ELS 732. This is an advanced course with a focus on how inferential statistics and multivariate analysis are applied in urban education, human services and educational technology research.

ELS 833. Advanced Research Design and Analysis. Lecture 3 hours; 3 credits. This course focuses on the application of advanced research design as it is applied to education, human services, and educational technology.

ELS 835. Organizational Theory and Behavior in Education. Lecture 3 hours; 3 credits. This course includes the psychology of organizational behaviors, theories of managing people, individual and organizational learning, individual motivation and organizational behavior, interpersonal communications and perceptions, group dynamics, problem management, managing multigroup work, managing diversity, leadership and organizational culture, leadership and decision making, the effective exercise of power and influence, supervision and employee development, organizational analysis, and managing change.

ELS 850. Advanced Educational Measurement and Assessment. Lecture 3 hours; 3 credits. The advanced study of selected measurement topics related to educational research

and evaluation. Topics include sociocultural factors affecting test performance, issues in reliability and validity, and using test information for evaluation and planning.

ELS 868. Internship: Urban Educational Leadership. 3 credits. Prerequisite: passing scores on the appropriate PRAXIS II content examination. This internship provides Education Specialist and doctoral students an opportunity to gain practicum experience in mid-level or senior administrative settings in higher education.

ELS 869. Instructional Internship. Title credits 20 hrs; 3 credits. Prerequisite: ELS 673. Each internship course will require students to complete a minimum of 160 hours in each course. Course is designed to provide field experiences which will prepare them to serve as instructional and curriculum leadership in K-12 environments. Student must produce 1) a portfolio with required artifacts; 2) prepare a 10-12 reflective paper according to identified guidelines and 3) complete internship evaluation with mentor and college supervisor at least three times during the term.

ELS 871. Educational Systems Planning and Futures. Lecture 3 hours; 3 credits. The course covers the theoretical framework of strategic, operational, cooperative and future planning in education, leading to the development of a cyclic planning process which includes the appropriate tasks, steps and skills to effect administrative and policy change.

ELS 874. Advanced School Law, Finance, and Operations. Lecture 3 hours; 3 credits. Prerequisite: ELS 657, 753/853 or equivalent. This course examines social justice issues related to the legal, financial, political, and operational aspects of America's public schools. The politics of current legislation, court cases, finances, and operations of the school system are included.

ELS 875. Morals and Ethical Dimensions of Leadership. Lecture 3 hours; 3 credits. This course provides students with an understanding of the moral and ethical dimensions of leadership and policymaking within the context of education. The readings, activities and discussions are all designed to assist practicing and aspiring administrators, students of educational policy, as well as other educators, in the explication and resolution of ethical dilemmas. Different moral positions will be considered, and students will be encouraged to examine both personal values and professional ethics. Special attention will be paid to issues of race, gender, class, sexual orientation, ability, religion, and other markers of social, economic, and/or political marginalization and exclusion.

ELS 876. Leadership for Social Justice. Lecture 3 hours; 3 credits. In this course, students study and engage in dialogue related to the critical role of education in a democratic society in a rapidly changing and increasingly complex world. Through a focused discussion of theories and concepts such as democratic schools, social justice, critical theory and power, feminism, critical race theory, and difference/normalization, students come to understand the possible roles education can play in society and their need to continuously reflect on their own vision for leadership in public schools.

ELS 878. Leadership for Teaching and Learning. Lecture 3 hours; 3 credits. In this course, participants examine what is currently known and explore what needs to be known about pedagogy in a context of school renewal. The foundational perspective for the course is social justice in which course participants seek ways to transform teaching/instruction so that all schools

work for all students particularly those students who historically have been disenfranchised from receiving an equitable education.

ELS 879. Field Research in School Administration and Supervision. 3 credits. Prerequisite: a master's degree. Field study approach to problems related to school administration and supervision.

ELS 880. Multicultural Curriculum Leadership and Globalization. Lecture 3 hours; 3 credits. Prerequisite: admission to the Ph.D. program. This course examines social justice issues related to the curriculum leadership aspect of American's public schools and abroad. This course is designed to provide advanced understanding of the curriculum development process through conception, implementation, and evaluation with a particular focus on multiculturalism. Theoretical and philosophical bases of curriculum development are addressed as well as current trends including brain-based learning, multiculturalism, globalization, organizational thinking and the strategic change process.

ELS 881. Dissertation Seminar. Lecture 3 hours; 3 credits. A seminar designed to help doctoral students develop a dissertation proposal. This course is intended for doctoral students who have completed all other coursework. Topics include the ethics of human subjects research, defining a research area and writing the introduction, literature review and methodology for the dissertation proposal.

ELS 883. Contemporary Issues in Education. Lecture 3 hours; 3 credits. This course is a survey of current issues in education, as well as the political, financial, and social issues affecting education leadership. The course will explore relationships between current issues, historical perspectives, philosophical theories, and sociologic influences. The exploration of contemporary issues related to equity and achievement will serve as a critical component of the class.

ELS 896. Topics in Urban Educational Leadership. 1-3 credits. Prerequisite: master's degree and permission of the instructor.

ELS 899. Dissertation. 1-12 credits. Prerequisite: permission of faculty advisor.

ELS 999. Educational Leadership & Supervision. 1 credit. This is a placeholder course for students who must be registered for a class and who are not registered for dissertation credit.

Exercise Science, Sport, Physical Education and Recreation

I. Physical Education — PE

Students enrolling in 200-level and above PE courses must be health and physical education majors or have permission of the instructor.

PE 404W/504. Adapted Physical Education. Lecture 3 hours; laboratory 2 hours; 4 credits. Prerequisite: PE 301. As a writing intensive course, the students will be acquainted with and research the different disabilities, learning modes of the exceptional child, IDEA-the law that advocates free and appropriate education, and working with the child with disabilities within an ecosystem. A vital component of the course will be the practical application of theory.

PE 497/597, 498. Topics in Health and Physical Education. 1-3 credits. Prerequisite: junior standing and approval of program advisor. This course provides an opportunity for in-depth study of selected topics in health and physical education.

II. Health Education — HE

HE 481/581. Teaching of Sexuality Education in the Schools. Three classes per week; 3 credits. Prerequisites: PE 300 and junior standing. This course is concerned with suitable methods and materials for use in teaching sex education in the home, community, and school setting. A family living element is in the program.

HE 497/597, 498/598. Topics in Health Education. Three classes per week; variable credit. Prerequisite: junior standing. This course provides an opportunity for in-depth study of selected topics in the variety of areas constituting health education.

III. Health and Physical Education — HPE

HPE 406/506. Tests and Measurement in Physical Education and Health. Three classes per week; 3 credits. Prerequisite: junior standing. This course is designed to acquaint the student with tests and measurement in the fields of health and physical education, test construction, scoring, and methods of using results.

HPE 487/587. Teacher Candidate Seminar. One hour; 1 credit. Prerequisites: acceptance into teacher education and approval of the program advisor. Study and group discussion of problems growing out of the student teaching (teacher candidate internship) experience.

IV. Recreation and Tourism Studies — RTS

RTS 410/510. Clinical Aspects of Therapeutic Recreation. Lecture and discussion 3 hours; 3 credits. Prerequisite: junior standing or permission of instructor. The course is designed to provide students with an understanding of treatment centered therapeutic recreation program design. The role of the recreation therapist will be explored. Topics will include patient assessment, activity analysis, documentation, treatment plans and program development.

RTS 441/541. Service and Operations Strategies in Tourism/Recreation. Lecture 3 hours; 3 credits. Prerequisite: junior standing or permission of the instructor. This course is designed to introduce students to theories and concepts related to successful service-oriented tourism and commercial recreation businesses. The course provides a solid foundation in the important aspects of hospitality and tourism organization operations including human resources, guest services, psychographics, demographics, marketing, and the assessment of industry trends.

RTS 461/561. Tourism and the Hospitality Industry. Lecture 3 hours; 3 credits. Prerequisite: junior standing or permission of instructor. This course explores tourism from a social perspective. The focus of the course will be on economic and social dimensions of tourism, tourism development strategies, and current research in hospitality from national and international case studies.

RTS 475/575. Tourism and Cultural Heritage Management. Lecture 3 hours; 3 credits. Prerequisite: junior standing or permission of the instructor. This course examines the principles and practices of planning, marketing, and managing cultural tourism. Assessment, development, and maintenance of cultural tourism products are explored.

RTS 495/595. Topics. 1-3 credits. Prerequisite: junior standing. This course provides an opportunity for in-depth study of selected topics in the variety of areas comprising recreation and tourism studies.

RTS 611. Grant Writing for Human Movement Sciences. Lecture 3 hours; 3 credits. This course examines the grant writing process. This includes, but is not limited to, the Office of Research, The Research Foundation, budgeting, human subjects, and partnerships. Students will be expected to submit a grant application by the end of this course.

RTS 616. Theory and Application in Recreation and Tourism. Lecture 3 hours; 3 credits. Course examines concepts, theories, and applications in recreation and tourism. The role of recreation/tourism from the local to the global level is explored. Focus is placed on principal factors influencing the distribution of recreation and tourism and their impact on development.

RTS 619. Strategic Marketing in Recreation and Tourism. Lecture 3 hours; 3 credits. Course is designed to examine the principles and practices of strategic marketing as it pertains to tourism planning and development. The course will explore market analysis in segmenting and identifying specified tourist markets.

RTS 638. Fiscal Planning and Management in Sport and Recreation. Lecture 3 hours; 3 credits. This course is designed to examine the principles and practices of financial management in diverse sport and recreation service settings. This course will explore the basic concepts of financial planning and analysis required to effectively manage a successful operation. (cross-listed with SMGT 638)

RTS 650. Readings in Contemporary Issues in Recreation, Sport, Health and Physical Education. Lecture 3 hours; 3 credits. Literature and research on ethical issues in sport, recreation, and wellness settings. Emphasis will be placed on administrative ethical decision-making skills and practices.

RTS 660. Legal Aspects of Sport. Lecture 3 hours; 3 credits. Prerequisite: graduate student standing. Course will introduce students to various aspects of the legal system as it relates to the management and supervision of sport facilities, programs, participants, spectators, and events. (cross-listed with SMGT 660)

V. Exercise Science, Sport, Physical Education and Recreation — ESPR

ESPR 601. Adapted Physical Education Design and Supervision. Lecture 3 hours; 3 credits. This course is divided into three sections. First section deals with learning how to administer and interpret several evaluation tools. Second section concentrates on developing computer, video taping, and other technology skills for adapted PE. Third section focuses on overall supervision of adapted PE programs in various school and institutional environments.

ESPR 605. Principles of Movement Analysis in Team Sports for Physical Education. Lecture 3 hours; 3 credits. The course is designed to help teachers and coaches improve their skills in analyzing movement skills in team sports activities. Such skill analysis is necessary to effectively diagnose movement deficiencies, prescribe techniques for improving performance, and modifying activities for the adaptive program.

ESPR 606. Planning and Administration of an Effective Health and Physical Education Program. Lecture 3 hours; 3 credits. Research in sport pedagogy has revealed that good teachers possess competencies in communication, classroom management, discipline, and organization different from less effective teachers. Students in this course will examine the literature

in support of effective teaching behaviors and practice techniques designed to improve classroom communication skills.

ESPR 607. Principles of Movement Analysis in Individual Sports for Physical Education. Lecture 3 hours; 3 credits. The course is designed to help teachers and coaches improve their skills in analyzing movement skills in individual sports activities. Such skill analysis is necessary to effectively diagnose movement deficiencies, prescribe techniques for improving performance, and modifying activities for the adaptive program.

ESPR 609. Principles of Movement Analysis in Dance and Rhythmic Activities for Physical Education. Lecture 3 hours; 3 credits. The course is designed to help teachers and coaches improve their skills in analyzing movement skills in dance and rhythmic activities. Such skill analysis is necessary to effectively diagnose movement deficiencies, prescribe techniques for improving performance, and modifying activities for the adaptive program.

ESPR 617. Athletic Training - Physical Assessment of the Human Body. Lecture 3 hours; 3 credits. Prerequisite: students must be admitted into graduate athletic training program. The assessment of the bodily functions/systems as they relate to the care of the athlete. Major areas of concentration include ears, eyes, nose, throat, heart, lungs, g-i tract and urinary tract.

ESPR 618. Current Research in Athletic Training. 1 credit. Designed to provide exposure to the scientific review of evidence-based research.

ESPR 621. Strength and Conditioning Applications. Lecture 3 hours; 3 credits. A study of the principles and techniques utilized in optimizing physical performance and reducing injury through proper and effective strength and conditioning programs. Special emphasis will be placed on current research findings, breakthrough techniques and advanced weight training techniques, and popular conditioning practices.

ESPR 622. Contemporary Issues in Athletic Training. Lecture 2 hours; 2 credits. Designed to expose the student to current and up to date ideas and techniques in the area of athletic training.

ESPR 623. Athletic Training Practicum I. 1 credit. Designed to provide practical experience in the athletic training setting and an understanding of evidence-based practice in the sports medicine setting.

ESPR 626. Advanced Orthopaedic Assessment and Rehabilitation. Lecture 3 hours; 3 credits. This course entails an in-depth examination of tests utilized to assess injury and encompasses a detailed review and examination of rehabilitation protocol components for the extremities.

ESPR 627. Advanced Orthopaedic Evaluation and Assessment. Laboratory 2 hours; 1 credit. Advanced techniques in the assessment of the extremities.

ESPR 628. The Spine: Evaluation and Rehabilitation. Lecture 3 hours; 3 credits. A course designed to provide information relative to the recognition, evaluation and rehabilitation of athletic injuries involving the spine.

ESPR 630. Exercise Physiology. 3 credits. Prerequisite: EXSC 409/509 or equivalent. Review of current physiological literature related to muscular exercise including the cardiovascular-respiratory system, metabolic effects of exercise, neuromuscular relationships, and the effects of training or diet, environment, ergogenic aids, temperature, attitude, and other factors on performance and health.

ESPR 633. Athletic Training Practicum II. 1 credit. Designed to provide practical experience in the athletic training setting and an understanding of evidence-based practice in the sports medicine setting.

ESPR 635. Research Methods in Health, Physical Education, Recreation and Sports. 3 credits. Types of research, selection of problems, location of research information, collection and classification of data, organization, presentation and interpretation of materials.

ESPR 636. Research Problems in Health, Physical Education, Recreation and Sports. 3 credits. Prerequisite: ESPR 635; taken in the last semester of graduate work. Practice in the use of statistical and analytical techniques in solving problems in education; supervised student research.

ESPR 642. Clinical Exercise Testing and Prescription. Lecture 3 hours; 3 credits. Prerequisite: ESPR 630. Principles of diagnostic exercise assessment, cardiovascular physiology, electrocardiography, ACSM guidelines to exercise testing and prescription for symptomatic and asymptomatic populations.

ESPR 643. Athletic Training Practicum III. 1 credit. Designed to provide practical experience in the athletic training setting and an understanding of evidence-based practice in the sports medicine setting.

ESPR 649. Clinical Methods in Athletic Training. Lecture 3 hours; 3 credits. Stresses clinical techniques involved in the use of therapeutic modalities, muscle energy, and various rehabilitative concepts.

ESPR 653. Athletic Training Practicum IV. 1 credit. Designed to provide practical experience in the athletic training setting and an understanding of evidence-based practice in the sports medicine setting.

ESPR 655. Supervised Teaching Internship. 2 credits. Individualized practical experience in the area of athletic training education.

ESPR 657. Lower Extremity Injury Management Strategies. 3 credits. Stresses clinical techniques used in the management and assessment of the lower extremity and spine through utilization of evidence based practice.

ESPR 661. Seminar in Nutrition for Sports and Health. 3 credits. This course is an in-depth analysis of the role of nutrition in health and human physical and athletic performance. General areas covered include the role of the six major classes of nutrients in health and sport, physiologic and metabolic interrelationships, malnutrition, nutrition in growing and aging, and diet and nutrition in the prevention of disease.

ESPR 667. Internship in Health, Physical Education, Recreation and Sports. 1-6 credits. Prerequisite: completion of 75 percent of graduate work. Designed to provide detailed practical experience (400 clock hours) in one of the areas of health education, physical education, recreation and sports. Required of all students entering the administrative emphasis areas without a minimum of one year full-time administrative experience.

ESPR 670. Administrative Principles for Recreation, Sport, Health and Physical Education. Lecture 3 hours; 3 credits. Director responsibility in recreation, sport, health and physical education; development of an understanding of the administrative and supervisory competencies required of directors in health, physical education, recreation and sport.

ESPR 680. Problems in Health Education. Lecture 3 hours; 3 credits. Problems in teaching

health education on the elementary and secondary level; family life education, substance use and abuse, and mental and emotional health.

ESPR 691. Gross Anatomy for Sports Medicine Clinicians. Lecture 2 hours; laboratory 4 hours; 4 credits. Prerequisite: introductory anatomy or permission of instructor. Dissection of human cadavers with emphasis placed on the functional and clinical aspects of the upper and lower extremities, neck, and back as related to athletic injuries.

ESPR 695. Topics in Health, Physical Education, Recreation and Sport. 1-3 credits. Selected topic courses in health and physical education, sport management, and exercise science and wellness.

ESPR 697. Independent Study. 1-3 credits. Investigations in health, physical education, recreation and sport. Problems approved in advance are investigated under the supervision of the faculty advisor.

ESPR 698-699. Thesis. 3-6 credits. Prerequisite: permission of the advisor and committee.

ESPR 711/811. Analysis of Human Motion. Lecture 3 hours; 3 credits. This course will include theories and applications of techniques concerning the analysis of human motion. It is designed to provide opportunities for the advanced study of motion analysis techniques for the study of human movement. The intent of this course is to provide students with an extensive knowledge concerning quantitative analysis of human motion and the concepts and equipment to collect objective quantifiable data to be used for clinical or research purposes. Lecture and laboratory concepts will be utilized to instruct students on the foundations of biomechanical data collection and major emphasis will be placed on using 2-D and 3-D motion analysis, forceplates, videography, and electromyography equipment for the analysis of human motion. As is the case in any biomechanical analysis of human motion instrumentation course, each student should expect to spend several additional hours each week in the laboratory over and above those scheduled as class time.

ESPR 720/820. Curriculum Development in Physical Education. Lecture 3 hours; 3 credits. A course designed to acquaint the student with the basic principles and practices in curriculum development. Curriculum development methodologies for both K-12 and college curricula will be addressed.

ESPR 725/825. Clinical Biomechanics for Rehabilitation Professionals. Lecture 3 hours; 3 credits. This course will include advanced theories of biomechanics, pathomechanics, and clinical anatomy relevant to the rehabilitation process of the physically active. Specific rationale will be discussed concerning mechanical properties of musculoskeletal tissues including: structure, function, mechanical properties, healing process, and factors affecting mechanical and healing properties. Participants will examine current and traditional literature from various academic disciplines, including biomechanics, engineering, neuroscience, exercise science, physical education, neurology, and rehabilitation to identify ways this information may be applied to athletic training and related orthopaedic rehabilitation disciplines. Application is stressed as related to the biomechanics, pathomechanics, and functional anatomy for dimensions of movement and athletic performance.

ESPR 739/839. Current Research in Motor Development. Lecture 3 hours; 3 credits. This course will examine the current theories and research relating to qualitative and quantitative changes in motor skills. Attention will be given to structuring learning experiences to maximize development. The perspective will include the entire life span.

ESPR 740/840. Principles and Concepts of Motor Learning. Lecture 3 hours; 3 credits. This course will include analysis of motor learning theories and selected factors as they affect the development of motor skills. Practical application and research potential will be included throughout the course to enhance the depth and breadth of motor learning knowledge. The course is designed to teach students the advanced principles and concepts of motor learning so they might apply it to their clinical and research endeavors.

ESPR 745/845. Assessment and Evaluation in Physical Education. Lecture 3 hours; 3 credits. This course is designed to acquaint the student with tests and measurement instruments in the fields of health and physical education, test construction, scoring, and methods of interpreting test results. Methodologies for both K-12 and college classes will be included.

ESPR 756/856. Education in Athletic Training. Lecture 3 hours, Laboratory 2 hours; 4 credits. Designed to introduce current concepts of curriculum development, evaluation methods, course construction and testing as related to the athletic training clinical and didactic experience. Designed to introduce the graduate student to aspects of the management of learning and instruction; how learners learn and how teachers can facilitate their learning as related to the athletic training didactic and clinical experience.

ESPR 815. Introduction to Doctoral Study Seminar. Lecture 3 hours; 3 credits. This course explores current issues and trends in all aspects of human movement science and relates theory to practice.

ESPR 816. Research Experience I. Lecture 3 hours; 3 credits. Determination of a research project through the review of literature. Course encompasses formulation of a topic along with the design of a research study.

ESPR 817. Research Experience II. Lecture 3 hours; 3 credits. Supervised research implementation, data collection, and project completion of specific topic within curriculum and instruction or applied kinesiology concepts.

ESPR 855. Neuroanatomical Basis of Human Movement. Lecture 3 hours; 3 credits. This course will include advanced theories of anatomy, biomechanics, motor control, and movement disorders. It will emphasize neuroanatomical mechanisms that apply to the processes of voluntary movement. The select topics include; basic functional anatomy, physical and chemical foundations of brain and spinal cord, muscle reflexes and spinal connections, muscle contraction mechanics, and sensorimotor system overview.

ESPR 895. Topics. Lecture 3 hours; 1-3 credits.

ESPR 897. Readings and Research in Content Area. 3 credits. Independent study with a faculty member. A guided review of the literature to determine the history, development, and issues of areas within human movement sciences, curriculum and instruction and applied kinesiology.

ESPR 898. Dissertation Research. 1-3 credits. Determination of a research project through the review of literature. Course

encompasses formulation of a topic along with the design of a research study.

ESPR 899. Dissertation. 1-12 credits. Prerequisite: permission of dissertation committee chair. Work on pre-selected dissertation topic under the direction of dissertation chair.

ESPR 999. Exercise Science, Sport, Physical Education and Recreation 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

VI. Exercise Science — EXSC

EXSC 408/508. Nutrition for Fitness and Sport. Lecture 3 hours; 3 credits. Prerequisite: BIOL 250 or equivalent. Emphasizes the role of nutrition as a means to enhance health and performance in sport. Topics covered include energy metabolism and nutrients, regulation of metabolism by vitamins and minerals, and weight control.

EXSC 409/509. Physiology of Exercise. Lecture 3 hours; 3 credits. Prerequisites: BIOL 250. An investigation into the physiological adjustments of the human organism to exercise including systematic as well as biochemical molecular changes. Major areas of concern include neuromuscular, metabolic, and cardiorespiratory changes during exercise and the influence of such variables as nutrition, drugs, environment, age, sex, training, and body weight.

EXSC 415/515. Exercise Testing for Normal and Special Populations. Lecture 3 hours; laboratory 2 hours; 4 credits. Prerequisite: EXSC 409 or 426. The application of different methodologies in the measurement of physiologic responses to exercise. Emphasis is placed on understanding American College of Sports Medicine guidelines, appropriate experimental techniques, and equipment necessary to evaluate changes in body composition and various metabolic, cardiovascular, and respiratory adjustments during exercise.

EXSC 417W/517. Advanced Kinesiology and Biomechanics. Lecture 3 hours; laboratory 2 hours; 4 credits. Corequisite: PHYS 111N. Prerequisite: EXSC 322. Advanced study and application of anatomical kinesiology in the study of human movement and biomechanics through videographic analysis and other techniques.

EXSC 420. Research Methods in Exercise Science. Lecture 3 hours; 3 credits. Prerequisite: STAT 130M or permission of instructor. Introduction to the scientific method applied to exercise science research including bioethics, review of the literature, research design, data collection, appropriate statistical analysis, research writing, and peer review.

EXSC 426/526. Exercise Physiology I. Lecture 3 hours; 3 credits. Prerequisite: BIOL 250. An investigation into the metabolic adaptations, neuromuscular, endocrinological, and respiratory responses to acute and chronic exercise endeavors. Implications for enhanced health and physical performance are integrated.

EXSC 427/527. Exercise Physiology II. Lecture

3 hours; 3 credits. Prerequisites: EXSC 426/526 and BIOL 250. A continuation of Exercise Physiology I. Focuses on cardiovascular responses to exercise and applied exercise physiology, specifically the effects of different training modes, environmental factors, aging, disease states, nutrition, and ergogenic aids.

EXSC 428/528. Exercise Prescription for Chronic Disease. Lecture 3 hours; 3 credits. Prerequisite: EXSC 409 or 426. A study of pathophysiology of common diseases with concentration in the design, implementation and administration of exercise prescription for a variety of chronic diseases.

EXSC 431/531. Wellness Programming and Administration. Lecture 3 hours; 3 credits. Prerequisite: EXSC 409 or 426. An introduction to the principles of administration and implementation of fitness and wellness programs to individuals, groups, centers and corporate settings.

VII. Sport Management — SMGT

SMGT 456/556. Sport Psychology. Lecture 3 hours; 3 credits. Prerequisite: junior standing; graduate standing or permission of instructor. Study of the psychological bases of coaching strategies and methodologies. Emphasis is placed on applying knowledge in field settings.

SMGT 497/597. Independent Study in Sport Management. 3 credits. Prerequisite: permission of the instructor. Individualized instruction to include research, specialized studies, or other scholarly writing.

SMGT 638. Fiscal Planning and Management in Sport and Recreation. Lecture 3 hours; 3 credits. This course is designed to examine the principles and practices of financial management in diverse sport and recreation service settings. This course will explore the basic concepts of financial planning and analysis required to effectively manage a successful operation. (cross-listed with RTS 638)

SMGT 646. Sport Marketing. Lecture 3 hours; 3 credits. This course will examine marketing concepts and principles that apply directly to the sport setting. Marketing research as it applies to a better understanding of the sport product and consumer will be analyzed. Special emphasis will be placed on studying and applying the steps in the marketing process.

SMGT 650. Ethics in Sport Management. Lecture 3 hours; 3 credits. This course is designed to provide students with an understanding of ethics and morals and how each applies in sport management settings. This course will include the study of theoretical models of moral development. In addition, teleological and deontological theories of ethics will be examined with special application made to the sports environment. Models of ethical analysis, codes of ethics in sport organizations, and the development of a personal and administrative philosophy will also be emphasized. The case study approach will be used to examine ethical issues.

SMGT 652. Sport Facility Management. Lecture 3 hours; 3 credits. An examination of the principles and practices of sport facility management. Special emphasis will be placed on the planning and design of sport facilities and specific management functions related to facility supervision, financing, marketing, public relations,

risk management, security, operations, maintenance, programming, and scheduling.

SMGT 653. Sport Sponsorship/Event Planning. Lecture 3 hours; 3 credits. This course is designed to provide students with a detailed examination of the relationship between sport and corporate sponsorship. Topics will include sport sponsorship, strategic communication through sponsorship, sponsorship valuation, and evaluation of sponsorship packages. Special emphasis will be placed on the relationship between sport sponsorship development, event planning, and fund-raising.

SMGT 655. Sports in Society. Lecture 3 hours; 3 credits. The course will examine the nature and scope of sport from sociological, historical, economic, and philosophical perspectives. Special emphasis will be placed on studying selected issues and topics that impact sport managers and their understanding of the role that sport plays in society. Sport related topics include commercialism, deviance, drugs, gender, mass media, Olympic Movement, politics, race, religion, social class, social mobility, gambling, special populations, violence, youth sports, and the future of sport.

SMGT 660. Legal Aspects of Sport. Lecture 3 hours; 3 credits. Prerequisite: graduate student standing. Course will introduce students to various aspects of the legal system as it relates to the management and supervision of sport facilities, programs, participants, spectators, and events. (cross-listed with RTS 660)

SMGT 664. Field Experience in Sport Management. 6 credits. Prerequisite: permission of internship coordinator. Designed to provide detailed practical experience (400 clock hours) in a sport management field setting.

SMGT 675. Management and Leadership in Sport. Lecture 3 hours; 3 credits. This course will examine various management principles that relate to sport settings. Special emphasis will be placed on studying leadership theories, human resource management, strategic planning, decision making, problem solving, policy development, and governance in sport.

Health, Physical Education and Recreation--See Exercise Science, Sport, Physical Education and Recreation

Higher Education — HIED

HIED 668. Internship in Higher Education Administration. 3-6 credits. Prerequisites: permission of instructor, COUN 633, 635, 707/807 and HIED 708/808 and 745/845. The university advisor and site supervisor will work with the student to develop and implement a set of objectives intended to familiarize the student with the operation of an administrative area within an institution of higher education, to assist the student to acquire practical skills in the operation of that office and to develop skills that are transferable to other administrative areas.

HIED 708/808. Contemporary Issues in Higher Education. Lecture and discussion 3 hours; 3 credits. This course is intended to present a broad exploration and generate greater understanding of contemporary issues influencing higher education that will involve discussion, written and oral reports and the integration of knowledge across the spectrum of issues relating to higher education.

HIED 710/810. Introduction to Student Affairs Administration. Lecture 3 hours; 3 credits. Prerequisite: COUN 707/807. This course is intended to be an introduction to the practice of student affairs work in American Higher Education. It will introduce students to the theoretical foundations of student affairs. It will also provide students with a structural framework for student affairs organization, problems, issues and ideas.

HIED 712/812. Strategic Planning and Institutional Effectiveness. Lecture 3 hours; 3 credits. Strategic Planning and institutional effectiveness is becoming more and more important to institutions as funding sources change and students demand quality. This course will examine how these processes can be carried out on American campuses.

HIED 720/820. The Private College and University. Lecture 3 hours; 3 credits. The U.S. Higher Education system contains great diversity due to the inclusion of private institutions. This course will examine the structure and organization of Higher Education in the U.S. as well as differences and similarities between private and public institutions.

HIED 730/830. Seminar in Student Affairs Administration. Lecture 3 hours; 3 credits. Prerequisite: HIED 710/810. This course is intended to follow HIED 710/810 and will provide a more in-depth discussion of the issues from that course. It will provide discussion with senior student affairs administrators and explore issues such as relationships with other divisions and the focus on learning and student development.

HIED 731/831. Group Dynamics in Higher Education. Lecture 3 hours; 3 credits. Prerequisite: HIED 733/833. This course examines the principles and dynamics of group interaction and process while providing strategies for working with groups in higher education settings (i.e., focus groups, task groups, and student, staff, faculty and parent groups). Students will explore and develop leadership skills related to groups.

HIED 733/833. Professional Helping Skills in Higher Education. Lecture 3 hours; 3 credits. This course will focus on developing the knowledge, attitude and skills essential to working with individuals seeking assistance with problems that they face while in college. Listening and interviewing skills will be addressed.

HIED 737/837. Academic Issues In Higher Education. Lecture 3 hours; 3 credits. Prerequisite: HIED 759/859. This course will focus on the broad academic missions of U.S. higher education and examine various academic program structures and the roles of faculty, department chairs, deans, provosts and other academic administrators.

HIED 743/843. Introduction to International Higher Education Administration. Lecture 3 hours; 3 credits. This course surveys key aspects of international higher education administration in an American university setting, including study abroad, recruitment and admission of international students, international student and scholar services, and English language preparation.

HIED 744/844. Comparative Higher Education Systems. Lecture 3 hours; 3 credits. This course presents the development of the three primary systems of higher education in the world today: the U.S., British and European (Confidential) systems. It will also, as appropriate, examine other systems of higher education from around the world.

HIED 745/845. Today's College Student and Diversity. Lecture and discussion 3 hours; 3 credits. This course is a sociological survey of theoretical and research literature describing college students from multiple views. These include demographic profiles; undergraduate student growth and development; cognitive and non-cognitive predictors of the impact of the collegiate experience; implications and outcomes of college attendance; and the specific characteristics of particular student populations.

HIED 752/852. The Law of Higher Education. Lecture and discussion 3 hours; 3 credits. Legal perspectives related to higher education will be discussed as a major part of the course. Among the topics to be discussed will be the bases from which higher education law comes, current (case, state and regulatory) law, as well as risk management and liability issues for higher education. The remainder of the course will focus upon the ethical issues that must be faced when shaping and implementing institutional policy, curriculum and procedures. Some emphasis will be placed on the areas in which legal and ethical issues come into conflict. This course should be taken near the end of the master's program.

HIED 756/856. Higher Education Finance. Lecture 3 hours; 3 credits. Prerequisites: HIED 708/808 and 794/894. Higher Education Finance is an intensive course devoted to the examination of concepts and management practices in higher education finance. The course is intended to provide prospective college and university administrators with both a theoretical and working knowledge of techniques, issues, policy, and practices as they are related to management and administration of colleges and universities in the U.S.

HIED 757/857. The Multicultural University. Lecture 3 hours; 3 credits. Research, philosophical, and policy literature on multiculturalism in higher education administration and leadership is surveyed. Topics covered include demographics and multiculturalism, university mission, admission, program and student assessment and evaluation, benefits of multiculturalism, faculty roles and responsibilities, teaching and learning outcomes, recruiting and graduating multicultural students, inclusive curriculum design, and student services.

HIED 758/858. Higher Education Leadership. Lecture 3 hours; 3 credits. The course will provide students with the basic theory, knowledge and skills needed to be an effective leader within post-secondary educational institutions, with a primary focus on public, private and non-traditional four-year colleges and universities.

HIED 759/859. Higher Education Curriculum. Lecture 3 hours; 3 credits. Prerequisites: COUN 707/807, HIED 708/808. This course provides an introduction to the development and management of the curriculum within institutions of higher education.

HIED 761. Higher Education Capstone. Lecture 3 hours; 3 credits. Prerequisites: COUN 633, 635. The course is a culminating experience for the master's degree intended to integrate and apply the knowledge gained in the degree programs to complex issues with policy and practice in higher education.

HIED 762/862. Development and Fund Raising. Lecture 3 hours; 3 credits. The major areas of institutional advancement and fund-raising form the fundamental outline for the course. Students will explore the professional literature

and hear lectures from experts in the areas of: institutional marketing, event management, developing a campaign, use of the internet, donor identification and cultivation, planned giving, developing corporate partners, and foundation management.

HIED 766/866. The Contemporary Community College. Lecture 3 hours; 3 credits. This course is a study of the institutional characteristics of the community college, including a review of the history, purpose, students, faculty, administration and organization, finance, and social functions. Considerable attention will be given to current issues facing community colleges. This course is an elective within the master's program and a required course in the Ph.D. in Community College Leadership.

HIED 777/877. Advanced Program Assessment and Evaluation. Lecture 3 hours; 3 credits. Prerequisite: ELS 732. This course provides an in-depth examination of the role played by program assessment and evaluation in higher education and provides the skills and strategies necessary for administrators to prepare and carry out these programs.

HIED 793/893. The History of Higher Education in the United States. Lecture and discussion 3 hours; 3 credits. This course is designed to provide a broad overview of the historical development of higher education with a concentration on American higher education and its growth and development since the founding of Harvard in 1636. Because of its importance within the spectrum of higher education in the United States, some concentration will be spent upon the development of higher education in Virginia as well.

HIED 794/894. Organization and Administration of Higher Education in the United States. Lecture and discussion 3 hours; 3 credits. Through lectures, visiting presenters, student presentations of literature, and projects and readings, this course is designed to be an introduction/survey of administration, organization and governance of higher education institutions in the United States. In addition to introducing students to the issues, this experience is intended to help students understand the competencies and training necessary to undertake various operational roles in higher education.

HIED 795/895. Topics in Higher Education Administration. 1-3 credits. Prerequisite: permission of the instructor.

HIED 868. Internship: Higher Education Administration. 3 credits. This internship provides Education Specialist and doctoral students an opportunity to gain practicum experience in mid-level or senior administrative settings in higher education.

HIED 881. Dissertation Seminar. 3 credits. A seminar that focuses on the design, implementation, and evaluation of higher education under real-life conditions in the field. Students and faculty work with higher education decision makers utilizing problem-solving skills and analysis.

HIED 899. Dissertation. 1-12 credits. Prerequisite: permission of faculty advisor.

HIED 999. Higher Education 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Human Services — HMSV

HMSV 440W/540. Program Development, Implementation, and Funding. Lecture 3 hours; 3 credits. Prerequisites: HMSV 341, 344, 346, and 368. This course represents models and practices of developing, implementing, and evaluating human services programs. The course includes an introduction to grant writing and fund raising.

HMSV 441/541. Non-Profit Fund-Raising in Human Services. Lecture 3 hours; 3 credits. Prerequisites: HMSV 341 and 440W. This course is designed to expose human service students to the art of ethical fund-raising in human services, including annual and capital campaigns, telemarketing, special events, direct mail marketing, face-to-face solicitation, e-fund-raising, and grant writing.

HMSV 444/544. Psycho-educational Groups. Lecture 3 hours; 3 credits. Prerequisite: HMSV 343. This course combines lectures and experiential learning about psycho-educational groups. Principles and practices for developing and leading psycho-educational groups are emphasized.

HMSV 447/547. Addictions: Theory and Intervention. Lecture and discussion 3 hours; 3 credits. Prerequisites: HMSV 341 and 12 hours in human services. This course examines the etiology, risk factors and treatment of alcoholism and other addictions.

HMSV 450/550. Addictions: Assessment and Treatment Planning. Lecture 3 hours; 3 credits. Prerequisites: HMSV 447 and 12 hours of Human Services courses or permission of instructor. Examines the diagnostic criteria for substance use disorders as well as other mental health disorders often seen in substance abusing populations. Provides a systemic approach to screening assessment and treatment planning.

HMSV 451/551. Loss, Grief and Growth. Lecture and discussion 3 hours; 3 credits. Prerequisite: ENGL 111C. This course offers a study of loss and grief and development of the ability to help those who have experienced loss. Growth through the experience of loss is explored.

HMSV 454/554. Principles and Practices of Vocational Rehabilitation. Lecture 3 hours; 3 credits. Prerequisites: HMSV 343, 344, 346, and 440W. This course provides basic information on the disability law and worker's compensation. Fundamentals of vocational rehabilitation will also be presented.

HMSV 455/555. Assessment and Placement Techniques in Vocational Rehabilitation. Lecture 3 hours; 3 credits. Prerequisites: HMSV 343, 344, 440W, and 454. This course emphasizes tests, behavioral assessment and observational techniques used to evaluate vocational rehabilitation clients.

HMSV 456/556. Diversity Experience in Ireland. 3 credits. Prerequisite: HMSV 341 or permission of instructor. This course is an in-depth, cross-disciplinary study of cultural similarities and differences in approaches to social conflict and other social problems in the United States and in Ireland. A two-week study abroad period will bring students into intensive contact

with educators, scholars, and community activists in Ireland. This course will also serve as an introduction to multicultural helping. The influence of socio-identities (e.g. race, ethnicity, religion, gender, socioeconomic status, sexual orientation) on individuals' functioning, concerns, and the helping process will be explored.

HMSV 495/595. Topics in Human Services. 1-6 credits. Prerequisite: senior standing or permission of the instructor. The study of selected topics in human services.

Instructional Design and Technology — IDT

IDT 475/575. Web Development for Educators. Lecture 3 hours; 3 credits. Prerequisite: senior standing/graduate standing. Provides both a conceptual framework and hands-on experience in the design and development of online web resources for educators. The course introduces the student to the various uses and features of online tools and technologies, investigates online learning strategies, and explores best practices in the use of the web to enhance learning. Topics include fundamentals of web authoring; screen design, use of web page creation tools, and functional use of HTML and derivatives.

IDT 617. Foundations of Instructional Technology. Lecture 3 hours; 3 credits. Required introductory overview to the field of instructional technology. Topics include a history of the field, basic instructional design, generally accepted theoretical practices and major formats of instructional media. Emphasis is given to instructional technology trends as applied to various industries, including K-12, military, industry training, and others.

IDT 647. Online Learning. Lecture 3 hours; 3 credits. Theoretical and applied survey of the field of online learning, with an emphasis on asynchronous environments. The course will cover current models, including computer conferencing and virtual reality. Topics will include facilitating online discussion, using interactive simulations, when to use course management products, fostering learning communities, implementing blended or mixed-mode models, synchronous online tools, and future directions. This course will be taught entirely online.

IDT 731/831. Distributed Learning Trends. Lecture 3 hours; 3 credits. Prerequisite: IDT 475/575 or instructor's permission. Students will undertake an intensive study of the main trends and issues shaping distributed learning environments. Focus will be on standards, reusability and quality and their impact on teaching and learning. Students will build a knowledge framework on distributed learning and the interplay of standards, reusability and quality.

IDT 746/846. Foundations of Distance Education. Lecture 3 hours; 3 credits. An analysis of the trends, issues, and theories of distance education in education, business, and military applications. Students will examine various distance education systems, policies and lessons from different perspectives.

IDT 748/848. Instructional Technology Product Evaluation. Lecture 3 hours; 3 credits. Prerequisite: IDT 749/849. Provides an overview to the science of evaluation, both as a general field and as applied to instruction. Topics will include evaluating the effectiveness of learning technologies; building survey instruments; online and computer-assisted testing; reporting practices; as well as formative, summative program and

performance evaluation and assessment. The unique demands of evaluating mediated education and learning environments will be considered.

IDT 749/849. Instructional Systems Design. Lecture 3 hours; 3 credits. Students will gain hands-on experience applying a theoretical understanding of instructional design and development to actual projects. Students will learn and use the Instructional Systems Design Process from initial learner profile analysis to design and development through to evaluation. Students will work individually and in teams to gain experience similar to real-world instructional design situations. Students will master the fundamental practices upon which the instructional design process is based.

IDT 752/852. Diffusion and Adoption of Instructional Technology Innovations. Lecture 3 hours; 3 credits. This course will explore theories, research, and strategies related to the diffusion and adoption of instructional technology innovations in education and training. The course will explore why and how individuals, groups, and organizations adopt or fail to adopt an innovation or change.

IDT 756/856. Instructional Gaming: Theories and Practice. Lecture 3 hours; 3 credits. Provides both a conceptual framework and experience in the design and development of instructional games. The course introduces the student to the history, research, theory, and practice of instructional games. Topics include discussions of relevant learning theories associated with instructional gaming, analysis and design of games and current research in instructional gaming.

IDT 760/860. Cognition and Instructional Design. Lecture 3 hours; 3 credits. Students will be introduced to the theoretical frameworks that form the basis of instructional systems theory and design. Focus will be on learning theories, instructional psychology, and instructional system theory. Recent developments in cognition, learning and instruction for educators will also be considered. Topics include perspectives of behaviorism, social-historical constructivism, cognitive science, situated cognition, and cultural influences on cognition.

IDT 761/861. Applied Instructional Design. Lecture 3 hours; 3 credits. Prerequisite: IDT 749/849. Problem-based course in which students gain experience applying knowledge from IDT 749/849 to real-world instructional and instructional technology problems. Project work is individual, paired, and in teams. Students demonstrate mastery of the instructional design and development process through production of tools, technologies, media or materials that successfully resolve an instructional problem. Focus is on rapid prototyping model.

IDT 763/863. Instructional Design Theory. Lecture 3 hours; 3 credits. Students will investigate traditional and contemporary instructional design theories and models. Behavioral, cognitive, generative, problem-based learning, and constructivist theories as well as cognitive hierarchies will be examined, compared, contrasted and applied to various instructional situations.

IDT 773/873. Advanced Instructional Design Techniques. Lecture 3 hours; 3 credits. Corequisite: IDT 749/849. Exploration and application of techniques, tools and competencies characteristic of expert designers. Topics may include: instructional strategies, use of design software, program design, advanced analysis

techniques, motivation design, rapid prototyping, reducing design cycle time, and designing instruction for diverse learner populations.

IDT 795/895. Topics in Instructional Design and Technology. 1-3 credits. Provides opportunities for master's and doctoral students to explore topics related to instructional design.

IDT 801. Instructional Design and Technology Seminar. Lecture 3 hours; 3 credits. Introduces new Ph.D. students to the field of instructional design and technology and provides orientation to doctoral level study. The course includes reading, critiquing and analyzing empirical research, theories, and real-world instructional problems. Potential student research agendas consistent with faculty or programmatic research foci will be explored. Academic and technological expectations will be communicated and practiced.

IDT 810. Trends and Issues in Instructional Design and Technology. Lecture 3 hours; 3 credits. Prerequisite: 9 hours IDT coursework. Exploration and discussion of trends and issues of current and historical significance to instructional design. Readings will include contributions of key scholars, past and present, in instructional design and related fields. Includes analysis of trends and issues to track and predict their impact on the future of the field.

Library Science — LIBS

LIBS 602. Production of Instructional Materials. Lecture 3 hours; 3 credits. Prerequisites: graduate standing, LIBS 675, ECI 530. Develops skills in preparing, evaluating, and presenting instructional materials and the use of those materials to promote higher level thinking and to enhance the teaching learning environment. Includes logistics and safety concerns of a production facility, and development of in-service activities. Hands-on practice in producing television programs and using compute software to produce instructional materials.

LIBS 605. Selection and Utilization of Non-Book Media. Lecture 3 hours; 3 credits. Prerequisites: graduate standing, LIBS 675, ECI 530. Emphasizes selection, purchase and utilization of non-book materials (e.g., periodicals, computers, CD-ROM, DVD, LANs, wireless networks, PDAs, e-books, retrieval systems, video conferencing, DL, on-line services, telecommunications, presentation systems). Included are staff development, systems management, information policies, networks, and the impact of professional associations on non-book resources.

LIBS 642. Children's Literature Across the Curriculum, PK-8. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Students examine, evaluate, discuss, and use literature and related nonprint materials for children and young adolescents and explore strategies for using trade books across the curriculum and for introducing children to literature. Materials for adolescents and adults with limited reading abilities are also covered.

LIBS 675. Administration, Management, and Evaluation of Libraries. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Entry-level course dealing with the planning, organization, and management of the school library media center. Includes professionalism and ethics in librarianship, facilities planning to impact student learning, and management of human resources.

LIBS 676. Library Media Services and the Curriculum. Lecture 3 hours; 3 credits. Prerequisites: graduate standing and LIBS 675. Emphasis is on library services/ programs and the curriculum of the school. Includes techniques for curriculum design and development, information skills instruction, instructional partnerships, advocacy, implementation of an integrated library-media instructional program and public relations programs.

LIBS 677. Technical Services in Libraries. Lecture 3 hours; 3 credits. Prerequisites: graduate standing and LIBS 675. Describes the fundamentals of description, cataloging, processing, organizing, and accessing of materials. This includes on-line circulation systems, descriptive cataloging using AACR2R and MARC, Dewey Decimal Classification, and Sears Subject Headings. Also discusses bibliographic networks and utilities in technical services and the relationship of technical services procedures to the overall mission of the SLMC.

LIBS 678. Selection, Evaluation and Utilization of Materials NK-12. Lecture 4 hours; 4 credits. Prerequisites: graduate standing, LIBS 642, 675. Emphasis is on reading and evaluating current materials for children and young adults, researching reading/viewing/ listening preferences, analyzing studies dealing with literature/media, and selecting materials. Also includes collection analysis and development.

LIBS 679. Theory and Management of Reference and Information Retrieval. Lecture 3 hours; 3 credits. Prerequisites: graduate standing and LIBS 675. Students evaluate, select, and use reference sources; explore strategies for teaching reference skills across the curriculum; use curriculum information to evaluate reference collections and prepare bibliographies; and explore issues related to reference services. Utilizes print as well as existing and emerging technologies.

Occupational and Technical Education — OTED

OTED 400/500. Instructional Systems Development. Lecture 3 hours; 3 credits. Prerequisite: junior standing. Students learn how to design and develop classroom instructional materials including career and technical education and training curricula and programs for youths and adults. Skills in this area include the selection and use of materials, including media and computers and evaluation of pupil performance. Training specialist students learn to develop instructional materials using the instructional systems design process. Career and technical education students learn to plan instruction, to implement competency-based and standards-based education, and to modify and use the Virginia career and technical education curriculum guides.

OTED 401/501. Foundations of Career and Technical Education. Lecture 3 hours; 3 credits. Prerequisite: junior standing. This course is designed to teach career and technical education majors to plan, develop, and administer a comprehensive program of career and technical education for high school students and adults. Students also develop an understanding of the historical and sociological foundations underlying the role, development and organization of public education in the United States.

OTED 403/503. Methods in Career and Technical Education. Lecture 3 hours; 3 credits. Prerequisite: junior standing. A practical study and application of recommended methods of teaching career and technical education to high school

students. Video-taped micro-teaching demonstrations are included. The course should be taken the semester prior to student teaching.

OTED 408/508. Advanced Classroom Issues and Practices in Career and Technical Education. Lecture 3 hours; 3 credits. Prerequisite: junior standing and passing scores on PRAXIS I or State Board of Education-approved SAT or ACT scores. An overview of classroom issues and practices for prospective career and technical teachers. The course covers classroom management and safety, communication processes, reading in the content area and child abuse and neglect recognition and intervention. Students learn the legal requirements and alternative teaching strategies for serving students with special needs. Students visit schools for a 30-hour student observation. PRAXIS II completion is a course requirement.

OTED 484/584. Student Teaching Mentored. 6-12 credits. Prerequisites: completion of the approved teacher education program in the major area, departmental approval, and permission of the director of teacher education services. Passing scores on PRAXIS I or State Board of Education-approved SAT or ACT scores and passing scores on the appropriate PRAXIS II content examination required. Classroom placement in school systems for students to apply content and methodologies. The student is mentored by a school mentor and university faculty. This course is for newly hired teachers on provisional contracts.

OTED 486/586. Middle School Student Teaching for Technology Education. 6 credits. Prerequisites: OTED 305, 306, 408, ESSE 313, ECI 408 and OTS 450; or OTED 508, 596, 730, 788, ECI 608, 616, 680 for graduate students. Passing scores on PRAXIS I or State Board of Education-approved SAT or ACT scores and passing scores on the appropriate PRAXIS II content examination are required. Classroom placement for student teaching in a middle school technology laboratory. Students apply content and methodology under the supervision of a cooperating teacher and university faculty member. Available for pass/fail grading only. (qualifies as a CAP experience)

OTED 496/596. Topics in Career and Technical Education. 1-3 credits each semester. Prerequisite: permission of the instructor. The department offers selected topics designed to permit small groups of qualified students to work in subjects of mutual interest which, due to their specialized nature, may not be offered regularly.

OTED 603. Planning Issues for Vocational Special Needs Programs. Lecture 3 hours; 3 credits. Overview of vocational special needs programs and services including their purposes and practices; characteristics of special populations, including the medical and educational aspects of disability.

OTED 604. Implementation and Administration of Vocational Special Needs Programs. Lecture 3 hours; 3 credits. This course includes career/life planning, transition, occupational information, and delivery of cooperative education programs, instructional methods, and curriculum modification and resources available to support vocational special needs programs.

OTED 606. Vocational Evaluation Processes. Lecture 3 hours; 3 credits. This course includes the basic concepts and skills of planning for and delivering vocational evaluation and career assessment services, the use of vocational interviewing, individualized service planning,

report development and communication, and use of modifications and accommodations. Students practice specific assessment techniques and skills and the processes used in vocational evaluation and career assessment, including job and training analysis, work samples and systems, situational and community-based assessment, behavioral observation, and learning and functional skills assessment.

OTED 635. Research Methods in Occupational and Technical Studies. 3 credits. Types of research, selection of problems, location of educational information, collection and classification of data, organization, presentation, and interpretation of findings. The focus is on conducting research in the student's content specialty area.

OTED 636. Problems in Occupational and Technical Studies. 3 credits. Prerequisite: OTED 635. Taken in the last semester of graduate work. Practice in the use of statistical and analytical techniques in solving problems in occupational and technical studies related to secondary, community college, and training environments.

OTED 695, 696, 795, 895. Topics in Occupational Education. 1-3 credits each semester. The OTS department offers selected topics designed to permit groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly.

OTED 697. Independent Study in Occupational Education. 1-3 credits each semester. Prerequisite: permission of the instructor. Individual study under the supervision of a graduate faculty member.

OTED 698. Thesis in Occupational Education. 3-6 credits. Prerequisite: permission of the advisor. Research and writing of the master's thesis and scheduled conferences with the candidate's advisor.

OTED 730/830. Introduction to Technology. 3 credits. Order and structure the discipline of technology by identifying and analyzing the component parts and examining technical means as critical variables in the affairs of humankind. Based on the Standards for Technological Literacy.

OTED 731/831. Technical Systems. 3 credits. Analyze the technical concepts common and unique to the technical systems of technology.

OTED 732/832. Program Development for Technology Education. 3 credits. Plan and develop effective program in technology related activities. Focus is on identification and development of resources, activities, and materials for classroom programs.

OTED 740/840. Readings in Occupational and Technical Studies. Lecture 3 hours; 3 credits. A guided review of the literature to determine the history, development, and issues of occupational and technical education, including specialization in technology education, career and technical education specialties, and human resources training.

OTED 750/850. Trends and Issues in Training: Modeling and Simulation. Lecture 3 hours; 3 credits. This course is designed to explore the issues and trends in developing and implementing technology-based training with emphasis on modeling and simulation.

OTED 760/860. Trends and Issues in Occupational Education. Lecture 3 hours; 3 credits. Trends in philosophy, workforce needs, curriculum and teaching procedures in occupational and technical education. Analysis of

research findings and issues related to tech prep and other articulated programs being established in secondary schools, community colleges, and four-year institutions.

OTED 761/861. Foundations of Adult Education and Training. Lecture 3 hours; 3 credits. This course is a study of adult education and training in many settings including the community college, business, industry, labor, government, the military, and social service agencies of many types. An attempt will be made to assess the important trends or directions such activities are taking, including the needs of non-traditional learners and education and labor.

OTED 762/862. Administration and Management of Education and Training Programs. Lecture 3 hours; 3 credits. This course deals with organizational policy, human and financial resources, facilities, and the planning process as applied to occupational education and adult training programs.

OTED 765/865. Trends and Issues of Economic and Workforce Development. Lecture 3 hours; 3 credits. Prerequisite: student must be accepted into doctoral program or have permission of the instructor. An analysis of economic trends and issues that lead to workforce development decisions. Focus is on planning for educational and training programs to meet workforce needs dictated by local and regional economic issues. This course is designed for community college and school system personnel.

OTED 780/880. Administration and Supervision of Occupational Education. Lecture 3 hours; 3 credits. Study of the principles and practices of administering and supervising occupational education programs.

OTED 785/885. Curriculum Development in Occupational Education and Training. Lecture 3 hours; 3 credits. A course designed to prepare students to design and develop curriculum for occupational education and training courses and programs. Included is a focus on articulation between secondary and community college and workforce needs.

OTED 787/887. Career and Technical Education Curriculum. Lecture 3 hours; 3 credits. Learn the various curriculum options taught in secondary schools under the auspices of career and technical education. Work from an administrative standpoint to learn the mission and goals of the various subject areas and plan to direct such efforts.

OTED 788/888. Instructional Strategies and Innovations in Training and Occupational Education. Lecture 3 hours; 3 credits. Learning and teaching styles are considered as a basis for developing instructional strategies to maximize occupational and technical education at all levels, including secondary, the community college, and senior institutions. Relevant learning theories and knowledge of self, learner, and the environment are blended to enhance the participants' instructional strategies.

OTED 789/889. Instructional Technology in Education and Training. Lecture 3 hours; 3 credits. A course that provides insights about trends, issues, and applications of instructional technologies as they may be applied to education and training environments. Topics include selected technical processes and electronic media to solve practical problems in education and training.

OTED 790/890. Practicum in Occupational Education. Lecture 3 hours; 3 credits. Prerequisite: permission of the graduate program director. Individually prescribed instruction under

the supervision of a graduate faculty member. Study intended to professionally fulfill development of graduate candidates.

OTED 797/897. Independent Study in Occupational Education. 1-6 credits. Prerequisite: permission of the instructor. Individual study under the supervision of an OTED graduate faculty member.

OTED 835. Research Design for Occupational and Technical Studies. Lecture 3 hours; 3 credits. Prerequisite: OTED 635 or equivalent. Analyses of current research and needs in occupational and technical studies. Students analyze the literature and develop a research focus for future graduate studies.

OTED 868. Internship. 3 credits. Prerequisite: permission of the instructor. Supervised assignment to an agency operating an occupational education or training program.

OTED 899. Dissertation in Occupational Education. 1-12 credits. Prerequisite: permission of dissertation committee chair. Work on pre-selected dissertation topics under the direction of dissertation committee chair.

OTED 999. Occupational and Technical Education 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Occupational and Technical Studies — OTS

OTS 402/502. Instructional Methods in Occupational Studies. Lecture 3 hours; 3 credits. Prerequisite: junior standing. Designed to develop a student's ability to use basic instructional techniques and methods applicable to career and technical education, and adults in business, government, and industrial organizations. It involves videotaped micro-teaching demonstrations.

OTS 409/509. Fashion Market Trip. Lecture 3 hours; 3 credits. Prerequisite: OTS 208. This is the study of planning and conducting a fashion buying trip to one of the major fashion markets in the United States like the Las Vegas Magic Trade Show. The students envision themselves as buyers in action and learn how trend forecasting and creative presentations help market fashion products and services to trade customers and consumers.

OTS 410/510. The Foreign Fashion Market Trip. Lecture 3 hours; 3 credits. Prerequisite: OTS 208. Students plan and conduct a fashion buying trip to a foreign market in Europe or Asia, and learn how to buy merchandise in the global marketplace. The course requires students to go on the trip as well as attend the pre- and post-trip classes.

OTS 411/511. Fashion Show Production. Lecture 3 hours; 3 credits. Prerequisite: OTS 220. Students plan and produce a fashion show. They examine each behind-the-scenes step from concept to execution as they organize and stage a show that is profitable, entertaining, and aesthetically pleasing.

OTS 423/523. Visual Merchandising and Display. Lecture 3 hours; 3 credits. Prerequisite: junior standing or permission of the instructor. This course is designed to introduce students to the best practices and effective strategies in visual merchandising. It will provide the basic framework with which prospective merchandisers plan and construct visual displays that enhance the selling of merchandise and ideas.

OTS 424/524. Fashion, Textiles, and Construction Analysis. Lecture 3 hours; 3 credits. Prerequisite: junior standing or permission of the instructor. This course explores information related to new technological advances in the textile/apparel industry and determines consumer preferences and concepts of fashion product quality. It includes the development of standards for judging qualities of merchandise. Fabrics are examined to determine the value they provide to the apparel and accessories customer.

OTS 430/530. Technology Applications in Training. Lecture 3 hours; 3 credits. Prerequisite: junior standing. This course is designed to prepare training professionals to plan and conduct training using technological applications. The course covers instructional technology skills, computer systems, and software that trainers need so that they can teach basic computer and information skills in business, industry and government.

OTS 431/531. Web-Based Organization for Fashion. Lecture 3 hours; 3 credits. Prerequisite: OTS 112. This course provides the basic communications foundations needed to conceive, plan, develop, implement, and maintain a Web-based organization for fashion. Upon completion, students will understand what is required to plan, launch and maintain a successful online venture, limited only by the willingness of the student to explore these technological advances.

OTS 450/550. Assessment, Evaluation and Improvement. Lecture 3 hours; 3 credits. Prerequisite: junior standing. This course prepares training and educational professionals to plan for and conduct assessments to use in planning

instructional programs, evaluate individual learning, monitor student progress, measure program effectiveness and efficiency, and evaluate the return on investments of training courses and programs.

OTS 471/571. Communication Industries. Lecture 3 hours; 3 credits. Prerequisite: junior standing and industrial technology major for 471. A course designed to provide career and technical education teachers, industrial technologists, counselors, and administrators an opportunity to observe and enhance their knowledge of representative communication industries from the local region. (qualifies as a CAP experience)

OTS 472/572. Construction Industries. Lecture 3 hours; 3 credits. Prerequisite: junior standing and industrial technology major for 472. A course designed to provide career and technical education teachers, industrial technologists, counselors, and administrators an opportunity to observe and enhance their knowledge of representative construction industries from the local region. (qualifies as a CAP experience)

OTS 473/573. Manufacturing Industries. Lecture 3 hours; 3 credits. Prerequisite: junior standing and industrial technology major for 473. A course designed to provide career and technical education teachers, industrial technologists, counselors, and administrators an opportunity to observe and enhance their knowledge of representative manufacturing industries from the local region. (qualifies as a CAP experience)

OTS 474/574. Service Industries. Lecture 3 hours; 3 credits. Prerequisite: junior standing and industrial technology major for 474. A course

designed to provide career and technical education teachers, industrial technologists, counselors, and administrators an opportunity to observe and enhance their knowledge of representative service industries from the local region. (qualifies as a CAP experience)

OTS 475/575. Transportation Industries. Lecture 3 hours; 3 credits. Prerequisite: junior standing and industrial technology major for 475. A course designed to provide career and technical education teachers, industrial technologists, counselors, and administrators an opportunity to observe and enhance their knowledge of representative transportation industries from the local region. (qualifies as a CAP experience)

OTS 495/595. Topics in Occupational Education. 1-3 credits each semester. Prerequisite: permission of the instructor. The department offers selected topics designed to permit small groups of qualified students to work in subjects of mutual interest which, due to their specialized nature, may not be offered regularly.

OTS 496/596. Topics. 1-3 credits.
OTS 497/597. Independent Study in Occupational Education. 1-6 credits. Prerequisite: permission of the instructor.

Physical Education-See Exercise Science, Sport, Physical Education and Recreation

Recreation and Tourism Studies — See Exercise Science, Sport, Physical Education and Recreation

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 Modeling and Simulation

- D. Eng. Aerospace Engineering
 Civil and Environmental Engineering
 Engineering Management and Systems Engineering
 Mechanical Engineering
 Modeling and Simulation

- Master's Aerospace Engineering
 Civil Engineering
 Electrical and Computer Engineering
 Engineering Management
 Environmental Engineering
 Experimental Methods
 Mechanical Engineering
 Modeling and Simulation
 Motorsports Engineering
 Systems Engineering

- Master of Engineering Management (M.E.M)
 Engineering Management

- Accelerated Degree Programs
 Accelerated Bachelor's/Master's Degree Programs
 Direct Bachelor's-to-Ph.D. and Integrated Bachelor's/Ph.D. Programs

- Graduate Certificate Programs
 Advanced Engineering Certificate
 Bioelectronics Certificate
 Certificate of Professional Study in Engineering Management
 Coastal Engineering Certificate
 Engineering Management Certificate
 Homeland Security Certificate
 Modeling and Simulation for Large-Scale Computational Mechanics
 Wireless Communication Certificate

- Commonwealth Graduate Engineering Program (CGEP)

- Virginia Consortium for Engineering and Science Universities (VCES)

Frank Batten College of Engineering and Technology

102 Kaufman Hall
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Mission Statement

The Batten College of Engineering and Technology promotes the advancement of engineering knowledge, both in creation and dissemination, by providing successful graduates and a continuously improving learning environment to its constituents, while maintaining high ethical, multicultural and global standards.

Overview

The Batten College of Engineering and Technology at Old Dominion University offers degrees in engineering and engineering technology. The course of study that leads to engineering degrees is characterized by a solid foundation in theoretical underpinnings of engineering based in mathematics and physics. Graduates are well equipped to pursue graduate education, professional registration, or enter the engineering profession.

The engineering programs at Old Dominion University are specifically designed to take advantage of unique assets in the Hampton Roads area. These assets include: 1) a strong military presence with multiple high technology facilities, particularly as it relates to modeling and simulation; 2) the NASA Langley Research Center with its focus on aeronautics and space exploration; 3) the Jefferson Laboratories, a major center of nuclear physics and home of a major Free Electron Laser; 4) one of the major international deepwater ports on the east coast of the United States; 5) a major ship building and ship repair industry, including Northrop Grumman, Newport News Shipbuilding, the only builder of nuclear aircraft carriers in the U.S.; 6) Virginia Beach, the largest city in the state of Virginia; and, 7) a major high technology industry base. These assets have enabled the development of distinctive engineering and technology curricula.

Programs of Study

Table 1 lists the programs of study offered at master's and/or doctoral levels.

Table 1: Graduate Degrees Offered.

Programs of Study	Master's	Doctoral
Aerospace	x	x
Civil	x	
Civil and Environmental		x
Design & Manufacturing	x	
Electrical and Computer	x	x
Engineering Management	x	x
Environmental	x	
Experimental Methods	x	
Mechanical	x	x
Modeling & Simulation	x	x
Motorsports	x	
Systems Engineering	x	

Master's-Level Programs

Admission Information

Each program requires a bachelor's degree in the appropriate field from an accredited institution of higher education and the submission of Graduate Record Examination (GRE) scores. The GRE requirement is waived for the master's program in civil engineering and environmental engineering if the applicant holds an ABET accredited engineering degree. Each applicant must submit an essay of 500 words or less describing personal and academic goals,

professional objectives, preparation for graduate study, and how the chosen program will help the applicant achieve these goals and objectives. Two letters of recommendation must be submitted from former or current professors except in civil engineering, environmental engineering and engineering management where letters from employment supervisors are also accepted. Regular admission to a master's program generally requires an undergraduate GPA of 3.0 or higher on a 4.0 scale. Applicants with a lower undergraduate GPA may be considered for regular or provisional admission on the basis of successful engineering work experience or other credentials demonstrating potential for success in the graduate program. Provisional admission may also be possible for applicants with a bachelor's degree in a field other than the applicant's intended graduate program. In such cases there will be pre-requisite course requirements. Exceptions to these requirements require consultation with the appropriate graduate program director.

Degree Requirements:

Master's degree requirements in various programs are summarized in Table 2 for non-thesis options and Table 3 for thesis options. The program abbreviations are: AE-Aerospace Engineering; CE-Civil Engineering; EnvE-Environmental Engineering; EE-Electrical Engineering; CpE-Computer Engineering; ME-Mechanical Engineering; ENMA-Engineering Management; MoSp- Motorsports; SYSE-Systems Engineering; MEXM-Experimental Methods; MSIM-Modeling and Simulation.

Table 2. Master of Engineering and Master of Engineering Management Degree Requirements

Minimum Requirements	AE	CE Project Option	CE Course Option	EnvE Project Option	EnvE Course Option	ECE	ME Project Option
Semester Credits of Course Work	30	27	30	27	30	30	27
Semester Credits of Research	0	3	0	3	0	0	3
Total Credits	30	30	30	30	30	30	30
Course Work Semester Credits of Graduate Math/Stat	3	3	3	3	3	3	3
Course Work Semester Credits in Major	24	15	18	15	18	18	18
Course Work Semester Credits at 600 Level or Above	24	18	18	18	18	18	18
Comprehensive Exam	written	oral project exam	oral	oral project exam	written	written	Oral project exam

Table 2 – Continued

Minimum Requirements	ME Course Option	MoSp	ENMA	MEXM	MSIM	SYSE
Semester Credits of Course Work	30	36	31	27	30	31
Semester Credits of Research	0	0	0	3 (AE691)	0	0
Total Credits	30	36	31	30	30	31
Course Work Semester Credits of Graduate Math/Stat	3	3	0	3	3	0
Course Work Semester Credits in Major	18	36	31	24	15	21
Course Work Semester Credits at 600 Level or Above	18	24	31	24	18	31
Comprehensive Exam	written	project exam	project exam	project exam	written	project exam

Table 3. Master of Science Degree Requirements

Minimum Requirements	AE	CE	EnvE	ECE	ME	ENMA	MSIM
Semester Credits of Course Work	24	24	24	24	24	27	24
Semester Credits of Research	6	6	6	6	6	6	6
Total Credits	30	30	30	30	30	33	30
Course Work Semester Credits of Graduate Math/Stat	3 (600 level or above)	3	3	3 (600 level or above)	3 (600 level or above)	0	3
Course Work Semester Credits in Major	18	12	12	18	18	27	15
Course Work Semester Credits at 600 Level or Above	18	15	15	18	18	24	18
Comprehensive Exam	Thesis defense	Thesis defense	Thesis defense	Thesis defense	Thesis defense	Thesis defense	Thesis defense

Doctor of Philosophy Programs

Admission Information

In addition to general University admission requirements, applicants must have a master's degree or equivalent and a grade point average of 3.50 in the appropriate field from an accredited institution of higher education. Additional requirements are listed in Table 4. The Graduate Record Examination (GRE) General Test is required of all applicants; the GRE requirement is waived for applicants in the Ph.D. programs of civil engineering and environmental engineering if the applicant holds an ABET-accredited engineering degree or graduate engineering degree from an institution of which the undergraduate degree is ABET-accredited. Each applicant must submit an essay of 500 words or less describing personal and academic goals, professional objectives, preparation for graduate study, and how the chosen program will help the applicant achieve these goals and objectives. All applicants must submit two letters of recommendation. Letters of recommendation must be from current professors. Engineering management applicants may submit letters from employment supervisors. Civil engineering and environmental engineering applicants are permitted to submit one of the two letters from an employment supervisor.

Table 4. Ph.D. Degree Admission Requirements

Minimum Requirements	GPA (previous graduate work) for provisional admission	Letter of Recommendation
AE	3.25	2
CEE	3.25	2
ECE	3.25	2
ME	3.25	2
ENMA	3.5	2 (interview required)
MSIM	3.25	3

Degree Requirements:

Table 5 lists requirements that are imposed by the Batten College of Engineering and Technology.

Table 5. Ph.D. Degree Requirement

Minimum Requirements	Course Work Semester Credit Hours	Dissertation Hours	Foreign Language Requirement
AE	24	24	May apply as research skill
CEE	24	24	None
ECE	24	24	None
ME	24	24	May apply as research skill
ENMA	27	24	None
MSIM	24	24	None

Accelerated Bachelor's/Master's Degree Programs

Please refer to the Undergraduate Catalog for more information.

Direct Bachelor's-to-Ph.D. and Integrated Bachelor's/Ph.D. Programs

Please refer to the Undergraduate Catalog for more information.

Doctor of Engineering Program

The College offers an interdisciplinary Doctor of Engineering (D.Eng.) program to provide the Commonwealth and the nation with exceptionally educated engineering practitioners. These individuals will have developed the highest possible capability to provide innovative solutions in specialized engineering endeavors. The graduates of the program will meet the highest standards for advanced level engineering and leadership positions in industry and government.

Curriculum

A minimum of 48 hours of graduate work beyond the master's degree is required including:

- 18 credit hours of core courses
- At least 18 credit hours of graduate coursework in the student's area of specialization
- At least 12 credit hours of applied doctoral project

At least three fifths of the course work must be at 800-level. The 18 credit hours of core courses are:

ENGN 811	Methodologies for Advanced Engineering Projects	3
ENMA 604	Project Management	3
ENGN 812	Engineering Leadership	3
ENGN 813	Engineering Ethics	3
ENGN 611	Financial Engineering	3
ENGN 612	Engineering Corporate Management	3

Five specialization areas are available: Aerospace Engineering, Civil and Environmental Engineering, Engineering Management and Systems Engineering, Mechanical Engineering, and Modeling and Simulation.

Admission Criteria

Consideration for admission to the Doctor of Engineering will require a formal application, undergraduate and graduate transcripts, and two letters of recommendation. Also required is an essay describing the applicant's preparation for graduate work, personal and academic goals, and professional objectives. One of the letters of recommendation should be from an agency point of contact if a sponsoring agency is involved. Sponsorship does not necessarily imply financial support, but it rather focuses on the provision of a project and access to data, information, and means to apply and test a solution. A personal or telephone interview of the applicant with the graduate program director will be required.

The minimum eligibility requirements for regular admission to the Doctor of Engineering program are: engineering experience of at least two years within the last five years and a master's degree with a grade point average of 3.50 out of 4.00 in an appropriate field from an accredited institution of higher education.

Continuation and Graduation Requirements

The continuation requirements are the same as the continuation requirements for the Doctor of Philosophy programs. The requirements for the Doctor of Engineering degree are as follows:

1. Satisfactory completion of a minimum of 48 credit hours of approved graduate work beyond the master's degree, including the doctoral project.
2. Satisfactory performance on a diagnostic examination at the completion of nine credit hours of coursework. The purpose of this examination is to determine if the student has adequate background to pursue a doctoral degree. The diagnostic examination may only be repeated once.
3. Satisfactory completion of a written and oral candidacy examination. The student will take the candidacy examination when he/she is within six credit hours of completing all the required coursework. The candidacy examination may only be repeated once.
4. Preparation and successful defense of a project concept proposal. The student will be required to prepare and present a concept proposal

related to the work that will be undertaken for the doctoral project. The concept proposal will be defended before the doctoral committee.

5. Submission of progress reports as deemed necessary by the doctoral committee.
6. Written report of the project results. The doctoral project shall be documented in a manner consistent with advanced, professional work. The project report will follow the standard format for Old Dominion University dissertations and theses.
7. Comprehensive oral defense of the doctoral project before the student's doctoral committee and a general audience.

The applied doctoral project must successfully demonstrate the student's mastery of the subject area and his/her ability to apply advanced technical knowledge to identify, formulate, and solve novel and complex engineering problems. The project must address a complex but practical problem currently faced by the public, industry, or government, and it must provide a solution that satisfies all the technical, social, political, economic, safety, sustainability, and environmental requirements and/or constraints. The doctoral project committee will have at least three Old Dominion University faculty members certified for graduate instruction; two faculty members must be from the major department. The committee must also have at least one non-University person with special knowledge of the project subject area.

Interdisciplinary Certificate Programs

Advanced Engineering Certificate

The Advanced Engineering Certificate Program consists of 12 credit hours of graduate level course work. The four courses comprising the certificate program are offered on a regular schedule to enable the completion of the program in two years. The program provides the opportunity for practicing engineers to further their knowledge and become more competent in their profession.

Program Requirements

Admission to the program requires a Bachelor of Science degree (or equivalent) in engineering. With the approval of the graduate program director, students select four graduate courses taught in CEE, ME, ECE, ENMA, MSIM, and AE. An overall grade point average of 3.0 or better is required to earn the certificate.

Bioelectrics Certificate

The Bioelectrics Certificate Program consists of 12 credit hours of graduate course work. The four courses comprising the certificate program are offered on a regular schedule to enable the completion of the program in two years. The program provides the opportunity for practicing engineers to further their knowledge and become more competent in the new field of bioelectrics.

Program Requirements

Admission to the program requires a Bachelor of Science degree (or equivalent) in engineering. The program consists of two graduate courses taught in ECE ("Introduction to Bioelectrics" and "Plasma and Pulsed Power Technology for Biomedical Applications") and two courses taught in Biological Sciences: BIOL 523 (Cellular and Molecular Biology) and BIOL 524 (Comparative Animal Physiology). An overall grade point average of 3.0 or better is required to earn the certificate.

Homeland Security Certificate

The Homeland Security Certificate Program consists of 12 credit hours of graduate level course work that can be taken across colleges. The four courses comprising the certificate program are offered on a regular schedule to enable the completion of the program in two years. The program provides the opportunity for students to further their knowledge and become more competent in their profession.

Program Requirements

Admission to the program requires a Bachelor's degree (or equivalent). The program will consist of three tracks, with courses taught in the colleges of Business and Public Administration, Batten Engineering and Technology and Arts and Letters. An overall grade point average of 3.0 or better is required to earn the certificate.

Required courses are ENMA 724 (Risk Analysis) and PADM 695 (Disaster Management). Students may elect to take ENMA 714 (Crisis Project Management) in place of ENMA 724 with approval.

Track One: CEE 646 (Contingency Readiness and Facility Management with GIS), ENGN 622 (Remote Sensing)

Track Two: PORT 612 (Port Operations and Management), PORT 614 (Port Planning and Economics)

Track Three: Students may choose any two courses from the following list: IS 701/801 (Global Change and American Foreign Policy), IS 702/802 (Collective Security), IS 706/806 (Causes of War), IS 707/807 (Interdependence, Power and Transnationalism), IS 720/820 (Global Security), IS 740/840 (Political Economy of Development), IS 795/985 (Politics of Middle East), IS 795/895 (Islam, War and National Question on the Russian Frontier), and CRJS 575 (Comparative Justice).

Collaborative Programs

Commonwealth Graduate Engineering Program (CGEP)

Linda Vahala, Director

The Commonwealth Graduate Engineering Program (CGEP) is a unique cooperative agreement. This agreement is among the five largest engineering schools in the Commonwealth of Virginia: Old Dominion University, George Mason University, the University of Virginia, Virginia Commonwealth University and Virginia Polytechnic Institute and State University. The program developed in response to the diverse continuing education needs of engineering graduates working in industry and government.

Graduate engineering courses leading to a Master of Science or Master of Engineering degree or nanotechnology certificate are offered through these universities via a statewide interactive distance-learning network.

Students seeking admission to the various degree programs should request and process their applications through the Commonwealth Graduate Engineering Program Office in the Batten College of Engineering and Technology at Old Dominion University: www.eng.odu.edu/cgep

Virginia Consortium for Engineering and Science Universities (VCES)

Linda Vahala, Director

VCES is a consortium established by the Commonwealth of Virginia consisting of Old Dominion University, the College of William and Mary, the University of Virginia, and Virginia Polytechnic Institute and State University. It is located in Hampton, VA, only a few miles from NASA Langley Research Center. The agreement between these institutions allows students to take courses from any of the participating institutions.

Department of Aerospace Engineering

1300 Engineering and Computational Science Building
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www.eng.odu.edu/aerospace

Colin Britcher, Chair

Brett A. Newman, Graduate Program Director

Degree Programs

The department of Aerospace Engineering offers the following graduate degrees:

Master of Science in Aerospace Engineering

Master of Engineering in Aerospace Engineering

Master of Engineering in Experimental Methods

Master of Engineering in Motorsports Engineering

Ph.D. in Aerospace Engineering

Doctor of Engineering in Aerospace Engineering

Degree Description

Graduate degrees in the Department of Aerospace Engineering include the Master of Engineering, Master of Science and Ph.D. degrees and are designed to prepare graduates for professional practice in teaching, research and development, design, and consulting. Graduates are prepared for challenging and rewarding employment in high-technology industries, research organizations, consulting firms and government agencies. These programs are also designed to serve both full-time and part-time graduate students. The department is closely associated with regional industries, consulting firms, government agencies and research laboratories, particularly the NASA Langley Research Center. Aerospace engineering students also benefit from the University's affiliation with the National Institute of Aerospace and the Virginia Modeling Analysis and Simulation Center.

All degree programs offered by the department can be utilized as components within the accelerated Baccalaureate-Master's and Baccalaureate-Doctoral degree programs offered through the Batten College of Engineering and Technology. For additional information about the educational and research opportunities available, request a departmental handbook from the graduate program director.

Master's Admission Information

To qualify as a candidate for a Master of Science, Master of Engineering, or a Master of Engineering in experimental methods or motorsports engineering, applicants must have completed undergraduate-level coursework that includes subject matter equivalent to a bachelor's degree in aerospace engineering, mechanical engineering, or engineering mechanics. The Master of Science degree requires a minimum of 24 semester credit hours of course work beyond the bachelor's degree with at least a B (3.00) average and a minimum of six semester credit hours of thesis research. The Master of Engineering degree requires a minimum of 30 semester credit hours of course work (36 semester credit hours for motorsports engineering) with at least a B (3.00) average. Aerospace master's degree students are required to take AE 605 or MATH 691 and AE 601 as part of their core course requirements. They must also take an additional three credit course at the 600-level or above in mathematics or an approved equivalent in aerospace engineering with heavy mathematical emphasis. Experimental methods students must take AE 605 and AE 606, and follow a more restrictive course selection as discussed below. Motorsports students take AE 605. A maximum of six semester credit hours (12 semester credit hours for motorsports engineering) may be derived from 500-level courses.

Master's Degree Requirements and Programs

Master of Science in aerospace engineering and Master of Engineering in aerospace engineering students are required to choose an emphasis area either in fluid mechanics, structural mechanics, or dynamics and controls, and take the designated core courses for that emphasis area. The remainder of the program will be selected primarily from the chosen emphasis area, according to the study plan developed by the student and faculty advisor.

Master of Science in Aerospace Engineering (Thesis)

The Master of Science degree in aerospace engineering is a research degree requiring a written thesis. The thesis constitutes six semester credit hours within the 30 semester credit hour requirement. Students are given a verbal examination, administered as the student's thesis defense, under the direction of the faculty advisor with support from the Thesis Advisory Committee. This examination consists of two parts, a student presentation of his/her thesis research and a closed session where the Thesis Advisory Committee further questions the student. The committee concentrates on research presented in both verbal and written formats, but may expand questioning to include related course work.

Master of Engineering in Aerospace Engineering (Non-Thesis)

The Master of Engineering degree in aerospace engineering is a non-research degree. The 30 semester credit hour requirement is thus met entirely by course work. During their final semester, students are required to pass a written examination covering their complete program of study. The master's comprehensive examination is administered by the faculty advisor with support from the Master's Examination Committee.

Master of Engineering in Experimental Methods

The Master of Engineering in experimental methods students are required to take AE 605, AE 606 and AE 691. Students must then take three required courses from two of the four specialty areas: fluid mechanics, structural mechanics, dynamics and controls, and design of experiments. An approved elective course completes the 30 credit hour program. Course combinations lead to emphasis in areas such as flow, noise or vibration control, robotics, flight controls, fluid-structure interaction, and wind tunnel testing. Students gain a solid foundation in advanced topics of selected technical areas coupled with hands-on experience using state-of-the-art test and measurement equipment.

Master of Engineering in Motorsports Engineering

The masters program in motorsports engineering is comprised of 36 credit hours and includes the following courses: AE 507, AE 557, AE 567, AE 577, AE 627, AE 637, AE 647, AE 657, AE 677, AE 687, and AE 692. Students will be required to attend lectures and laboratories on the main campus, at the Langley Full-Scale Tunnel, and at the Virginia Institute for Performance Engineering and Research, located close to Virginia International Raceway near Danville, Virginia.

The graduate core courses and emphasis courses in the department are listed below.

Core Graduate Courses

AE 601	Introduction to Continuum Mechanics	3
AE 602	Fluid Dynamics and Aerodynamics	3
AE 603	Energy & Variational Methods in Structural Mechanics	3
AE 604	Analytical Dynamics of Aerospace Vehicles	3
AE 605	Applied Engineering Analysis	3
AE 606	Real-Time Signals and Systems	3
AE 690	Aerospace Engineering Seminar	1

Aerodynamics and Fluids Graduate Courses

AE 506	Flight Vehicle Aerodynamics	3
AE 517	Propulsion Systems	3
AE 611	Supersonic Aerodynamics	3
AE 620	Computational Fluid Dynamics I	3
AE 621	Experimental Aerodynamics	3
AE 622	Aerospace Test Facilities	3
AE 709/809	Boundary Layer Theory	3
AE 710/810	Transonic Aerodynamics	3
AE 711/811	Hypersonic Aerodynamics	3
AE 712/812	Unsteady Aerodynamics and Aeroelasticity	3
AE 713/813	Turbulence Modeling	3
AE 714/814	Aerodynamic Flow Control	3
AE 720/820	Computational Fluid Dynamics II	3

Structures and Structural Dynamics Graduate Courses

AE 520	Aerospace Structures	3
AE 631	Aerospace Structures	3
AE 633	Flight Vehicle Structural Analysis	3
AE 634	Structural Vibrations I	3

AE 640	Finite Element Analysis I	3
AE 641	Experimental Structural Dynamics	3
AE 731/831	Mechanics of Composite Structures	3
AE 732/832	Thermal Stress Analysis	3
AE 733/833	Nonlinear Aerospace Structures	3
AE 734/834	Structural Vibrations II	3
AE 740/840	Finite Element Analysis II	3
AE 744/844	Active Control of Structures	3

Dynamics and Controls Graduate Courses

AE 503	Flight Mechanics	3
AE 638	Applied Analog and Digital Control	3
AE 650	Modern Control Theory	3
AE 660	Aerospace Vehicle Performance	3
AE 662	Flight Control Actuators and Sensors	3
AE 750/850	Autonomous and Robot System Analysis and Control	3
AE 760/860	Atmospheric Flight Dynamics and Control	3
AE 761/861	Space Flight Dynamics and Control	3
AE 763/863	Advanced Control Methodologies	3

Motorsports Courses

AE 507	Ground Vehicle Aerodynamics	3
AE 557	Motorsports Vehicle Dynamics	3
AE 567	Racecar Performance	3
AE 577	High Performance Piston Engines	3
AE 627	Aerodynamics for Motorsports	3
AE 637	Tire & Brake Performance	3
AE 647	Racecar Structures & Materials	3
AE 657	Performance Sensors & Analysis	3
AE 677	Drivetrain Design & Performance	3
AE 687	Team Dynamics & Leadership	3
AE 692	Team Summary Project	6

Others

AE 540	Introduction to Space Systems Engineering	3
AE 572	Statistical Foundations for Experimenters	3
AE 672	Design of Experiments	3
AE 684	Virtual, Synthetic Environments & Applications	3
AE 772/872	Response Surface Methodology	3
AE 780/880	Perturbation Methods in Aerospace Engineering	3
AE 783/883	Aeroacoustics	3
AE 784/884	Multidisciplinary Design Optimization	3
AE 785/885	Magnetic Suspension Technology	3

Generic Graduate Courses

AE 595	Topics in Aerospace Engineering	1-3
AE 597	Independent Study in Aerospace Engineering	1-3
AE 667	Cooperative Education in Aerospace Eng	1-3
AE 668	Internship in Aerospace Engineering	1-3
AE 669	Practicum in Aerospace Engineering	1-3
AE 691	Experimental Research Project	3
AE 695	Topics in Aerospace Engineering	3
AE 697	Independent Study in Aerospace Engineering	3
AE 699	Thesis Research in Aerospace Engineering	1-6
AE 795/895	Topics in Aerospace Engineering	3
AE 797/897	Independent Study in Aerospace Engineering	3
AE 899	Dissertation Research in Aerospace Eng	1-9

Doctor of Philosophy Degree Description

The Doctor of Philosophy degree in aerospace engineering is an advanced research degree requiring a written dissertation offering new and unique contributions of a fundamental nature.

Doctor of Philosophy Admission Requirements

To qualify as a candidate for a Doctor of Philosophy degree in aerospace engineering, a student must have completed graduate-level course work that includes subject matter equivalent to the master's programs in aerospace engineering or engineering mechanics.

Doctor of Philosophy Degree Requirements

A minimum of 24 credit hours of course work beyond the master's degree and a minimum of 24 semester credit hours of dissertation research must be included in the doctoral degree program. At least three-fifths of the course work for the doctoral degree should be 800-level courses and the student should maintain at least a B (3.00) average. Aerospace engineering students will be expected to concentrate primarily, but not necessarily exclusively, in a chosen

emphasis area of fluid mechanics, structural mechanics, or dynamics and controls. Doctoral students in the Aerospace Engineering Department should satisfy either a foreign language or research skill requirement. Doctoral students who are full-time are required to take a part-written, part-oral preliminary diagnostic examination during their first semester in the Ph.D. program. Part-time students should take the exam before completing nine credit hours. The preliminary diagnostic examination covers the master's core curricula, as well as the student's chosen emphasis areas.

Candidacy Examination

Students seeking a Doctor of Philosophy degree are given a part-written and part-oral examination administered as the student's candidacy examination. Questions are directed towards the student's research emphasis and supporting theoretical principles. Students must demonstrate a level of understanding that projects confidence in a successful completion of doctoral research requirements. After successfully passing the candidacy examination, a dissertation committee is formed and students are required to pass an oral presentation of their dissertation proposal.

Dissertation Defense

The dissertation defense consists of two parts, the student presentation and defense. The main purpose of the dissertation defense is to examine the candidate for original research contributions reflected in the dissertation. Students are permitted only two attempts in demonstrating their capability during the dissertation proposal as well as dissertation defense.

Doctor of Engineering

The Department offers a Doctor of Engineering (D.Eng.) program with concentration in Aerospace Engineering in accordance with the D.Eng. program criteria and requirements specified for the Batten College of Engineering and Technology in this catalog.

Department of Civil and Environmental Engineering

135 Kaufman Hall

757-683-3753

<http://eng.odu.edu/cee>

Gary Schafran, Chair

Isao Ishibashi, Graduate Program Director

Degree Programs

The department offers the following graduate degrees:

Master of Science in Civil Engineering

Master of Engineering in Civil Engineering

Master of Science in Environmental Engineering

Master of Engineering in Environmental Engineering

Ph.D. in Civil and Environmental Engineering

Doctor of Engineering in Civil and Environmental Engineering

Degree Description

In this rapidly changing technological world, graduate degrees are highly desirable and most often master's degrees are required to hold professional civil and environmental engineering positions in the industry, and in federal, state and municipal government agencies. The department's graduate programs are designed to educate the technological leaders of the future in civil and environmental engineering, and are structured to accommodate both full-time and part-time students. The specialty areas include coastal, geotechnical, structural, transportation and water resources engineering in civil engineering, and sub-fields in environmental engineering including water quality, water and wastewater treatment, hydrologic processes, water resources, environmental engineering microbiology, air quality, hazardous and solid waste, and pollution

prevention. For additional information please request a departmental handbook from the graduate program director.

Master's Admission Information

In addition to general University admission requirements, applicants' bachelor degrees should be in civil engineering, environmental engineering or in engineering with a strong background in mathematics and physical sciences. Provisional admission will be given to those applicants who do not hold a bachelor's degree in civil or environmental engineering; however these students will be required to complete undergraduate course work in addition to the graduate program requirements. Potential prerequisite courses are listed below.

Potential Prerequisite Courses for M.S. and M.E. in Civil Engineering:

MATH 211	Calculus I
MATH 212	Calculus II
MATH 307	Ordinary Differential Equations
MATH 312	Calculus III
PHYS 231N	University Physics I
PHYS 232N	University Physics II
CS 150	Introduction to Programming
CEE 100	Statics
ME 205	Dynamics
ME 220	Solid Mechanics
CEE 310	Structures I
CEE 323	Soil Mechanics
CEE 330	Hydromechanics
CEE340	Hydraulics & Water Resources
CEE 410	Concrete Design I

Potential Prerequisite Courses for M.S. & M.E. in Environmental Engineering:

MATH 211	Calculus I
MATH 212	Calculus II
MATH 307	Ordinary Differential Equations
MATH 312	Calculus III
PHYS 231N	University Physics I
PHYS 232N	University Physics II
CHEM 115	Found of Chemistry
CHEM 117	Princ of Chemistry
CS 150	Introduction to Programming
CEE 330	Hydromechanics
CEE 340	Hydraulics & Water Resources
CEE 350	Environmental Pollution & Control

Master's Degree Requirements

Civil Engineering and Environmental Engineering (except Transportation Engineering concentration): The graduate courses applicable towards a master's degree in the Department of Civil and Environmental Engineering are grouped into various categories listed below. The required number of the credit hours from these categories for the Master of Science (M.S.) and the Master of Engineering (M.E.) degrees in Civil Engineering (except transportation engineering concentration) and in Environmental Engineering are summarized in Table CEE-1 and CEE-2, respectively.

Category A – Upper level courses in Civil Engineering

CEE 710	Structural Dynamics	3
CEE 711	Finite Element Analysis	3
CEE 712	Advanced Reinforced Concrete	3
CEE 713	Prestressed Concrete	3
CEE 714	Advanced Structural Analysis	3
CEE 715	Engineering Optimization I	3
CEE 717	Bridge Structures Design	3
CEE 718	Engineering Optimization II	3
CEE 719	Inelastic Structures	3
CEE 720	Structural Stability	3
CEE 721	Plates	3
CEE 722	Cluster Parallel Computing	3
CEE 723	Seismic Design of Steel Structures	3
CEE 724	Retrofitting Methods for Bridges and Buildings	3
CEE 730	Advanced Foundation Engineering	3
CEE 731	Advanced Soil Mechanics	3
CEE 732	Engineering Behavior of Soils	3
CEE 733	Soil Dynamics	3
CEE 741*	Open Channel Flow	3

CEE 747*	Groundwater Flow	3
CEE 761*	Water Resource Systems Analysis	3
CEE 770	Transportation Safety	3
CEE 771	Transportation Operations II	3
CEE 772	Intelligent Transportation Systems	3
CEE 774	Transportation Planning	3
CEE 775	Transportation Network Models and Optimization	3
CEE 776	Simulation Modeling in Transportation Networks	3
CEE 782	Design of Coastal Structures	3
CEE 787	Dredging and Beach Engineering	3
CEE 788	Coastal Hydrodynamics and Sediment Transport Processes	3
CEE 789	Computational Environmental Fluid Dynamics	3

Category B – Upper level courses in Environmental Engineering

CEE 650	Pollution Prevention	3
CEE 653	Environmental Engineering Law	3
CEE 700#	Civil and Environmental Engineering Experimental Design	3
CEE 741*	Open Channel Flow	3
CEE 747*	Groundwater Flow	3
CEE 751	Physicochemical Treatment Processes	3
CEE 752	Biological Wastewater Treatment	3
CEE 753	Advanced Processes for Water and Wastewater Treatment	3
CEE 754	Environmental Engineering Microbiology	3
CEE 755	Water Quality Management	3
CEE 756	Water Quality Modeling	3
CEE 761*	Water Resource Systems Analysis	3
CEE 762	Aquatic Chemistry in Environmental Engineering	3

Category C – Lower level courses in Civil & Environmental Engineering

CEE 511	Concrete Design II	3
CEE 514	Masonry Structures Design	3
CEE 515	Steel Structures Design	3
CEE 516	Wood Structures Design	3
CEE 530	Foundation Engineering	3
CEE 531	Earth Structures Design with Geosynthetics	3
CEE 532	Introduction to Earthquake Engineering	3
CEE 540	Hydraulic Engineering	3
CEE 546	Urban Stormwater Hydrology	3
CEE 547	Groundwater Hydraulics	3
CEE 550	Water Distribution and Wastewater Collection System Design	3
CEE 552	Air Quality	3
CEE 554	Hazardous Wastes	3
CEE 558	Sustainable Development	3
CEE 570	Transportation Fundamentals	3
CEE 571	Transportation Operations I	3
CEE 576	Transportation Operations Applications	3
CEE 582	Introduction to Coastal Engineering	3

Category D – Other graduate courses

Graduate level courses offered from other departments. These courses must be related to the program of study and must be approved by the student's academic advisor.

MATH or STAT Category

CEE 700# Civil and Environmental Engineering Experimental Design; or a graduate level MATH or STAT course.

* Double listings in A and B categories.

Double listings in B and STAT categories

Table CEE-1. Required Course Distributions for M.S. and M.E. in Civil Engineering (except for Transportation Engineering Concentration)

M.S. – Thesis		M.E. – Project Option		M.E. – Course Option	
Category	Credit Hrs.	Category	Credit Hrs.	Category	Credit Hrs.
A	12	A	15	A	15
A, B, C, or D	9	A, B, C, or D	9	A, B, C, or D	9
MATH/STAT	3	MATH/STAT	3	MATH/STAT	3
Thesis	6	Project	3	A or B	3
Total	30 *	Total	30 *	Total	30

* Note: For M.S. and ME Project options, no more than 9 credit hours can be at 500 level.

Table CEE-2. Required Course Distributions for M.S. and M.E. in Environmental Engineering

M.S. – Thesis		M.E. – Project Option		M.E. – Course Option	
Category	Credit Hrs.	Category	Credit Hrs.	Category	Credit Hrs.
B	12	B	15	B	15
A, B, C, or D	9	A, B, C, or D	9	A, B, C, or D	9
MATH/STAT	3	MATH/STAT	3	MATH/STAT	3
Thesis	6	Project	3	A or B	3
Total	30 *	Total	30 *	Total	30

* Note: For M.S. and ME Project options, no more than 9 credit hours can be at 500 level.

For the M.S. option students must pass an oral thesis defense examination. For the M.E. project option students must pass an oral project defense examination. For the M.E. course option, student must pass an oral (for civil engineering) or written (for environmental engineering) comprehensive examination at the end of all course work.

Transportation Engineering Concentration in Civil Engineering

The department offers Master of Science (M.S.) and Master of Engineering (M.E.) degrees in Civil Engineering with concentration in Transportation Engineering. Table CEE-3 summarizes the requirements for the M.S. and M.E. degrees in the Transportation Engineering concentration. Note that an M.E. course option is not available in this concentration. The student must pass an oral thesis or project defense examination respectively for the M.S. and M.E. degrees.

Table CEE-3. Required Course Distributions for M.S. and M.E. in Civil Engineering – Transportation Engineering Concentration

	M.S. (Thesis) Credit Hrs.	M.E. (Project) Credit Hrs.
Core Courses (CEE 570, 571, 774)	9	9
Upper-level Transportation Elective (From CEE 770, 771, 772, 775, 776)	3	3
Statistics Course (CEE 700)	3	3
Other Courses (from CEE 770, 771, 772, 775, 776 and other approved electives – see below)	9*	12*
Thesis (CEE 699) or Project (CEE 698)	6	3
Total credit hours	30	30

*** No more than 3 credits can be at 500 level

Other Approved Electives

CEE 552	Air Quality	3
CEE 558	Sustainable Development	3
CEE 576	Transportation Operations Applications	3
CEE 715	Engineering Optimization I	3
CEE 718	Engineering Optimization II	3
ECE 505/MSIM 505	Introduction to Discrete Event Simulation	3
ECON 502	Transportation Economics	3
ENMA 600	Cost Estimation and Financial Analysis	3
ENMA 603	Operations Research	3
ENMA 717	Cost Engineering	3
ENMA 724	Risk Analysis	3
MSIM 601	Introduction to Modeling and Simulation	3
PADM 633	Methods of Urban Planning	3
PORT 611	International Maritime Transport	3
PORT 612	Port Operations and Management	3
PORT 614	Port Planning and Economics	3
PSYC 870	Human Factors Psychology	3
STAT 531	Theory of Statistics	3
STAT 532	Sampling Theory	3
STAT 535	Design and Analysis of Experiments	3
STAT 537	Applied Regression Analysis	3

STAT 549	Nonparametric Statistics	3
URBN 634	Regional Planning	3

Description of Doctor of Philosophy Degrees

Doctoral degrees in civil engineering and environmental engineering are required for college-level teaching and employment in research institutions. Many leading industries and agencies also seek well-trained doctoral graduates. The specialty areas include coastal, geotechnical, structural, transportation, and water resources engineering in Civil Engineering and a variety of sub-fields in Environmental Engineering including water quality, water and wastewater treatment, hydrologic processes, water resources, environmental engineering microbiology, air quality, hazardous and solid waste, and pollution prevention.

Doctor of Philosophy Admission Requirements

A master's degree or equivalent in engineering or a related field is required for admission; however exceptionally well qualified students can be admitted to the doctoral program directly without a master's degree. In addition to general University admission requirements, submission of GRE scores is required except for applicants who hold an ABET accredited engineering degree or a graduate engineering degree from an institution of which the undergraduate degree is ABET accredited. One of the two recommendation letters may be from an employer supervisor.

Doctor of Philosophy Degree Requirements

Refer to Table 5 for the college summary of degree requirements. Three-fifths (3/5) of the courses shall be from 800-level courses as required by the University.

Doctor of Engineering

The Department offers a Doctoral of Engineering program (D.Eng.) with concentration in Civil and Environmental Engineering in accordance with the D.Eng. program criteria and requirements specified for the Batten College of Engineering and Technology in this catalog.

Certificate Program

Coastal Engineering Certificate

David Basco, Director, Coastal Engineering Center

In order to provide the opportunity for practicing civil/coastal engineers to further their knowledge and to become more competent in their profession, the Department of Civil and Environmental Engineering offers a non-degree Coastal Engineering Certificate. Admission to the program requires a Bachelor of Science degree (or equivalent) in civil engineering, coastal engineering, or a related field (e.g. oceanography, geoscience). The program consists of the following four graduate courses (12 credit hours) that are taught over the course of two years (one each semester); these courses are made available on-line.

CEE 582	Introduction to Coastal Engineering (Spring, odd Year)
CEE 687	Dredging and Beach Engineering (Fall, odd year)
CEE 782	Design of Coastal Structures (Fall, even year)
CEE 788	Coastal Hydrodynamics and Sediment Transport (Spring, even year)

An overall grade point average of 3.00 or better is required to earn the certificate.

Department of Electrical and Computer Engineering

231 Kaufman Hall
757-683-3741
<http://eng.odu.edu/ece/>

Shirshak Dhali, Chair
Sacharia Albin, Graduate Program Director

Degree Programs

The department offers the following graduate degrees:
Master of Science in Electrical and Computer Engineering
Master of Engineering in Electrical and Computer Engineering
Ph.D. in Electrical and Computer Engineering

Degrees Description

The Department of Electrical and Computer Engineering strives to provide the highest quality engineering education at the undergraduate and graduate levels, to engage in scholarly research at the forefront of electrical and computer engineering, and to serve the profession of electrical and computer engineering. The department has strong graduate and research programs providing a high quality and broad-based education that prepares graduates for successful professional careers and a lifetime of learning. Electrical and computer engineering graduate studies encompass three broad areas: system science, physical electronics, and computer engineering. The department offers both master's and doctoral degrees in electrical and computer engineering. The research laboratories in the department include Computational Modeling and Research Laboratory, Laser and Plasma Engineering Institute, Medical Imaging Diagnostics and Analysis Laboratory, Microelectronics Laboratory and Clean Room, Photonics Laboratory, Systems Research Laboratory, Computational Intelligence and Machine Vision Laboratory, Wireless Communication and Networking Laboratory. In addition the department has strong ties to several off-campus laboratories including the Applied Research Center at the Jefferson National Laboratory, the Frank Reidy Center for Bioelectrics, and the Virginia Modeling Analysis and Simulation Center. These research facilities position the department for national leadership in several research areas and as a leading institution of research and higher education in the southeastern United States. For additional information, please visit our website at eng.odu.edu/ece.

Master's Admission Information

Applicants are expected to hold a B.S. degree in electrical engineering (EE) or computer engineering (CpE) from an accredited institution. Applicants are also expected to have a minimum grade point average of 3.0 (on a 4.0 scale) in both the baccalaureate major area (EE or CpE) and overall. Two letters of recommendation from former undergraduate instructors are also required. Applicants with academic degrees in areas other than electrical and computer engineering may be considered, subject to evaluation by the graduate program director. Those with degrees in math, physics, computer science, or other engineering fields are encouraged to apply. Accepted students from other disciplines may be required to complete additional courses from the list below to meet prerequisites for graduate studies.

List of Courses for Leveling Requirement

ECE 202	Circuits, Signals & Linear Systems	3
ECE 24 1	Fundamentals of Computer Engineering	4
ECE 304	Probability, Statistics & Reliability	3
ECE 313	Electronics Circuits	3
ECE 323	Electromagnetics	3
ECE 382	Electronics Laboratory	2

Master of Science and Master of Engineering in Electrical and Computer Engineering

Master's Degree Requirements

Both M.S. and M.E. degrees require a minimum of 30 credit hours of graduate study which consist of eight graduate courses plus a thesis for M.S. and 10 graduate courses for M.E. Both options are available to full-time and part-time students seeking to improve their professional skills in electrical and computer engineering. Students are required to complete two foundation courses from the specialized areas offered by the department. Remaining courses can be selected from the list of elective courses in order to meet the student's future career objectives. Students who are admitted with undergraduate degrees in technical fields other than electrical and computer engineering may be required to take additional undergraduate courses to meet prerequisites for graduate study.

Required courses for all graduate students

ECE 651	Statistical Analysis and Simulation	3
ECE 731/831	Graduate Seminar	1

Foundation Courses for Electrical and Computer Engineering (Choose 1)

ECE 601	Linear Systems	3
ECE 643	Computer Architecture Design	3
ECE 677	Intro. Nanomaterials: Synthesis, Properties and Applications	3

ELECTIVES

Systems

ECE 551	Communication Systems	3
ECE 558	Instrumentation	3
ECE 561	Automatic Control Systems	3
ECE 682	Analog VLSI	3
ECE 766/866	Nonlinear Control Systems	3
ECE 782/882	Advanced Digital Signal Processing	3
ECE 783/883	Digital Image Processing	3
ECE 787/887	Digital Communications	3

Computer

ECE 505	Introduction to Discrete Event Simulation	3
ECE 543	Computer Architecture	3
ECE 555	Network Engineering and Design	3
ECE 583	Embedded Systems	3
ECE 605	Engineering Systems Modeling	3
ECE 606	Visualization 1	3
ECE 607	Machine Learning 1	3
ECE 652	Wireless Communication Networks	3
ECE 642	Computer Networking	3
ECE 648	Advanced Digital Design	3
ECE 741/841	Formal Methods in Computer	3
ECE 742/842	Computer Communication Network	3
ECE 747/847	High Performance Computer Architecture	3

Physical Electronics

ECE 573	Solid State Electronics	3
ECE 578	Lasers & Laser Applications in Engineering	3
ECE 623	Electromagnetism	3
ECE 572	Plasma Processing at the Nanoscale	3
ECE 574	Optical Communications	3
ECE 653	Pulsed Power	3
ECE 774/874	Semiconductor Characterization	3
ECE 776/876	Advanced Semiconductor Devices	3
ECE 777/877	Semiconductor Process Technology	3
ECE 779/879	Applications of Laser Engineering	3

Suggested Non-major Electives

MATH 508	Applied Numerical Analysis	3
MATH 691	Engineering Analysis I	3
ENMA 520	Statistical Concepts in Engineering Mgmt	3
CS600	Algorithms & Data Structures	3
CS 635	Parallel Computer Architecture	3
CS 648	Computational Geometry	3

Additional Courses

ECE 595	Topics in Electrical & Computer Engineering	3
ECE 695	Topics in Electrical or Computer Engineering	3
ECE 699	Thesis	1-9
ECE 795/895	Topics in Electrical & Computer Engineering	3
ECE 899	Dissertation Research	1-9

Doctor of Philosophy Admission Requirements

Students can apply for a doctoral degree in electrical and computer engineering. Applicants are expected to have completed a master's degree in electrical engineering and/or computer engineering or a closely related technical field. Requirements beyond the master's degree include eight courses, a dissertation, and successful completion of the diagnostic and candidacy examinations. Additional course work or appropriate research background may be required to meet prerequisites for courses.

Description of the Doctoral Degree

The Department offers a strong doctoral program. Students in both the Electrical Engineering and Computer Engineering tracks can pursue a Ph.D. in Electrical and Computer Engineering. A very important component of the doctoral degree is the research pursued by the student which culminates in a written dissertation, as well as an oral defense of this work. Doctoral students usually publish the result of their research in highly reputable nationally and internationally referred journals. In addition, the students are encouraged to present their work at national and international conferences. A minimum of 24 credit hours (not including Graduate Seminars) of graduate-level courses beyond the master's degree or equivalent must be included in the doctoral program. Satisfactory completion of at least 48 semester hours of post master's or equivalent level of performance in course work, including the dissertation, is required. It is also required that at least 15 hours of course work be taken at 800 level. For more information please review the graduate handbook at eng.odu.edu/ece.

Wireless Networking Certificate

This graduate certificate program provides the working professional with a thorough knowledge of the engineering aspects of wireless networking and wireless communication that meet the requirements to practice in this highly evolving technological field. Students in the program will gain expertise in wireless networking focusing on wireless local area networks. The program will enable them to design and develop future voice, data and video systems utilizing wireless communications. The networks will incorporate mobile and fixed wireless systems.

Program Requirements

To obtain the certificate, each participant must successfully complete four three-credit graduate-level courses:

ECE 551	Communication Systems
ECE 555	Network Engineering and Design
ECE 652	Wireless Communication Networks
ECE 695	Topics: Advanced Topics in Wireless Networking

Students enrolling in this program must have an undergraduate B.S. degree in electrical or computer engineering or computer science. Applicants with appropriate background and with B.S. degrees in other engineering, math or science disciplines may qualify to enroll in the program, but will need to consult with the department. In general, all applicants will be expected to have a background in mathematics at least through integral calculus, some knowledge of computer programming, general computer literacy, and knowledge of scientific and engineering methods. Students may also complete the certificate program as part of a master's degree in electrical and computer engineering.

Department of Engineering Management and Systems Engineering

241 Kaufman Hall

757-683-4558

<http://www.eng.odu.edu/enma>

Resit Unal, Chair

Ghaith Rabadi, Graduate Program Director

Degree Programs

The department offers the following graduate degrees:

Master of Engineering Management

Master of Science in Engineering Management

Master of Engineering in Systems Engineering

Ph.D. in Engineering Management

Doctor of Engineering in Engineering Management and Systems Engineering

Degree Description

The Department of Engineering Management and Systems Engineering at Old Dominion University is the recipient of the American Society of Engineering Management's 1995, 2000, 2002, 2004, 2005 and 2007 awards for Excellence in Leadership in Graduate Programs. The Master of Engineering Management (MEM) program at Old Dominion University is also one of the first three in the nation that has been certified by the American Society for Engineering Management and is the first to have been recertified.

The Department of Engineering Management and Systems Engineering provides its graduates with the necessary skills, knowledge, and abilities required to design and manage the technology-based, project-driven enterprise. Fundamentally, the engineering management discipline addresses the problems, design, and management of projects and complex operations. The programs are grounded in solid principles of systems science and systems engineering while exploiting the tools of management science and project management. The Department of Engineering Management and Systems Engineering emphasizes the concept of technological leadership. Technological leadership focuses on the development of a professional perspective that anticipates opportunities for competitive advantages technology can provide to an enterprise.

Core course work in the engineering management and systems engineering programs concentrate on developing the knowledge and skills required by graduates to provide the project and program leadership and management necessary for an organization to develop and apply technologies. Technological leadership's vision looks to the creation of new products, processes, and services which, in turn, will create new markets or enable domination of existing ones. Through design projects and exercises centered around complex system and technology, students are led through alternative ways of thinking and communicating.

The engineering management and systems engineering programs at Old Dominion University provide students opportunities in the classroom and involvement with industrial partners. This allows students to gain confidence and experience to effectively create, integrate, and apply technology in enterprise operations.

Master's Admission Information

Master of Engineering Management/Master of Science in Engineering Management

Admission to graduate programs in engineering management is in accordance with the general requirements for graduate degrees as specified in the Admission section of this Catalog. Applicants must have an undergraduate degree from an ABET-accredited program in engineering or engineering technology or from an accredited program in applied science with a GPA of 3.00 (out of 4.00) or better. Students with an undergraduate GPA between 2.70 and 3.00 may be admitted provisionally based on their academic preparation

and GRE scores. The Department requires university level TOEFL scores for all international students when English is not their first language.

Master of Engineering—Systems Engineering

Admission to the graduate program in systems engineering is in accordance with the general requirements for graduate degrees as specified in this Catalog. Specific requirements for systems engineering include a bachelor's degree in science, engineering, mathematics, computer science, or other related field. Applicants with a bachelor's degree in a non-technical discipline with approved college-level calculus and five years experience are eligible for admission to the program. An undergraduate grade point average of 3.00 (out of 4.00) in both the major and overall is required. Students with a GPA between 2.70 and 3.00 may be admitted provisionally based upon their work record, academic preparation, and GRE scores. Students with a GPA below 2.70 must complete additional academic course work so their overall GPA is raised to the appropriate level for admission. A minimum TOEFL score of 550 is required for all international students when English is not their first language.

Master's Degree Requirements

Master of Engineering Management/Master of Science in Engineering Management

The M.E.M. and M.S. programs are oriented toward the design and management of technical projects, complex operations, and technology-based organizations. The Master of Science (M.S.) program requires thesis research, and the student is expected to identify an advisor and work with him/her starting from the first semester. Courses are scheduled in the evenings and at off-campus sites, including the Peninsula Higher Education Center in Hampton and the Virginia Beach Higher Education Center. A complete M.E.M. program is available through Old Dominion University's TELETECHNET distance learning program and through the Commonwealth Graduate Engineering Program. Both systems transmit courses to educational, industrial and government locations throughout Virginia.

The master's degree programs in the Department of Engineering Management and Systems Engineering are in accordance with the general requirements for master's degrees as specified in the Requirements for Graduate Degrees section of this Catalog. Specific requirements for the Master of Engineering Management and Master of Science in engineering management are as follows:

The Engineering Management and Systems Engineering Department requires 31 credit hours of course work (10 three-credit courses plus a one-credit capstone course) for the M.E.M. The M.S. degree requires 27 credit hours of course work and six credit hours of thesis research for a total of 33 credit hours.

Prerequisite Courses: All students must have mathematics course work through the level of integral calculus; matrix algebra or differential equations; and a course in statistics (ENMA 420/520 or equivalent).

Core Courses: Required core courses for the M.E.M. are ENMA 600, 601, 603, 604, 614, and 715. Required courses for the M.S. are ENMA 600, 601, 603, 604, 614, 715, and 721.

Elective Courses: Students must select twelve credit hours of elective coursework for the M.E.M. and six credit hours of elective course work for the M.S. degree. The electives may be selected from the ENMA courses and/or from courses in other departments with the approval of the graduate program director. All electives must be at the graduate level.

Capstone: ENMA 605 is required for the M.E.M. (to be taken in final semester).

Thesis Research: M.S. students take six credits of thesis research, which must be spread over a minimum of two semesters.

Exceptions to these requirements must be approved by the graduate program director.

Master of Engineering—Systems Engineering

The focus of this degree program is to provide students with in-depth, real-world practitioner expertise in engineering and the integration of complex system of systems for government and commercial clients. Students in the program are introduced to core competencies for system of system architectures, integration and engineering, processes, analysis, new technologies, and the engineering disciplines needed for successful delivery of executable systems.

The Master of Engineering degree program in systems engineering is in accordance with the general requirements for master's degrees as specified in

this Catalog. Specific requirements for the Master in Engineering with a concentration in systems engineering include the following:

The Engineering Management and Systems Engineering Department requires 31 graduate credit hours of course work (10 courses plus a one-credit capstone course) for the M.E. in systems engineering program.

Prerequisite/Corequisite Courses: All students must have mathematics course work through the level of integral calculus, matrix algebra or differential equations, and ENMA 520 or equivalent calculus-based probability and statistics. Students who have not had a calculus-based probability and statistics course will be required to include ENMA 520, or equivalent, as part of their plan of study.

Core Courses: The required core courses are: ENMA 612, 640, 641, 660, 715 and 771.

Capstone: ENMA 605 (or ENMA 688), required for the Master of Engineering in systems engineering, is to be taken in the final semester of study.

Electives: 12 credit hours from ENMA 702, 703, 710, 712, 716, 717, 723, 750, 751, 763.

Doctor of Philosophy in Engineering Management

The Doctor of Philosophy (Ph.D.) focuses on developing the necessary skills to perform and evaluate rigorous research in areas related to the design and management of projects, programs, and complex human-technological systems. The goal of the Ph.D. program is to prepare graduates for careers in teaching and research at academic institutions as well as in other public and private organizations characterized by innovation and technological leadership.

Ph.D. Admission Requirements:

Admission to graduate programs in engineering management and systems engineering is in accordance with the general requirements for graduate degrees as specified in the Graduate Admission section of this Catalog. Specific requirements for the Department of Engineering Management and Systems Engineering include the following: applicants for the Ph.D. must have a bachelor's or master's degree from an accredited institution in engineering, engineering technology, applied science or applied mathematics, and at least 24 semester hours of graduate study approved by the graduate program director. An undergraduate GPA of at least 3.00 and a graduate GPA of at least 3.50 (on a 4.00 basis) and GRE general aptitude scores are required. Students lacking adequate academic preparation may be admitted provisionally and may be required to complete coursework in addition to the graduate admission requirements. A minimum TOEFL score of 550 is required for all international students when English is not their first language. As part of the admission process, all applicants will go through an interview process. The applicant will be contacted by the graduate program director once the application and credentials are received to initiate the interview process. Students must also have an advisor prior to admission.

Ph.D. Degree Requirements:

Curriculum requirements in engineering management are in accordance with the general requirements for Ph.D. degrees as specified in the Requirements for Graduate Degrees section of this Catalog. Specific requirements for the Ph.D. in engineering management include the following: the Ph.D. degree requires a minimum of 51 semester credit hours beyond an approved master's degree, with a minimum of 27 hours of postmaster's graduate course work, and a minimum of 24 dissertation hours.

Requirements in preparing for the Ph.D. program in engineering management include:

1. Satisfactory completion of 51 credit hours of postmaster's degree credit or equivalent level of performance course work, including 24 credit hours of dissertation credit, and a minimum of 27 credit hours of course work.
2. Passing a written and oral candidacy examination at the end of the program of study course work.
3. The successful defense of a written dissertation proposal before the completion of nine hours of dissertation research.
4. The completion of a dissertation representing independent original research worthy of publication in a refereed scholarly journal.
5. The successful public defense of the dissertation before an audience which includes an appropriately selected committee of faculty knowledgeable in the field of the project.

Prerequisite Courses: All students must have mathematics course work through the level of integral calculus matrix algebra or differential equations and a course in statistics (ENMA 420/520 or equivalent).

Master's-Level Courses: As part of their 27 credit hours of master's-level course work, all students must have completed the following engineering management leveling courses or their equivalent: ENMA 600, 603, and 604. Students may be admitted to the Ph.D. program deficient in these leveling

courses, but as part of their plan of study, the student must take and successfully complete these courses at the earliest possible opportunity.

Plan of Study: The Ph.D. program is governed by a Plan of Study that is established by the student in conjunction with his/her advisor and guidance committee within the first nine credit hours of course work and will follow the established course requirements (below) unless a substitution to one or more courses is agreed upon between the advisor and student and approved by the graduate program director.

Course Requirements: Core Courses (12 credit hours): All students must take ENMA 821, Research Methods in Engineering Management.

Students must choose one course from each of the following three specialization area in Empirical Methods, Analytic Methods, and Social Research Methods:

EMPIRICAL METHODS: Statistical techniques and research approaches. The course should cover statistical techniques up to (at least) multivariate statistics covering techniques such as multivariate regression analysis, principal component factor analysis, cluster analysis, and canonical correlation analysis. If possible an introduction to structural equation modeling and non-parametric statistical analysis should be included. Courses to choose from:

ENMA 863 Robust Engineering Design
Equivalent Course (with GPD authorization).

ANALYTIC METHODS: Mathematical and other quantitative analytic techniques including modeling, analysis, and simulation approaches, and how they are applied within research. Methods such as system dynamics, agent based modeling, formal logic, and optimization methods should be addressed. Courses to choose from:

ENMA 803 Optimization Methods
ENMA 823 System Dynamics
ENMA 710 Modeling and Analysis of Systems
ENMA 711 Rational Decision Making
Equivalent course (with GPD authorization)

SOCIAL RESEARCH METHODS: Approaches common in the social sciences and humanities. Methods may include grounded theory (as used in social sciences), coding techniques, social (quasi-) experimentation, and fuzzy logic. Diverse data collection methods should be addressed including focus groups, interviews, surveys and questionnaires. Courses to choose from:

ENMA 815 Systems Analysis
ENMA 716 Complex Adaptive Situations Environment
Equivalent course (with GPD authorization)

Elective Courses (15 credit hours): Engineering Management courses or courses form other departments in the Colleges of Engineering and Technology, Sciences, and Business and Public Administration. All electives must be at the graduate level and must be approved by the Ph.D. Guidance Committee and graduate program director as part of the student's plan of study.

Dissertation Research: Minimum of 24 credit hours

Exams: A candidacy exam, dissertation proposal defense, and a public dissertation defense are required after completing all course work.

Doctor of Engineering

The Department offers a Doctor of Engineering (D.Eng.) program with concentration in Engineering Management and Systems Engineering in accordance with the D.Eng. program requirements specified for the Batten College of Engineering and Technology in this catalog. Additional information on the admission procedure and criteria can be found at <http://eng.odu.edu/enma/academics/dengapply.shtml>.

Certificate Programs

Certificate of Professional (C.P.S.) Study in Engineering Management

The Certificate of Professional Study in Engineering Management is a non-degree certificate program for post-master's degree students. The C.P.S. program is designed for working professionals who desire to continue their education beyond the master's degree and advance to senior management positions. The program specifically prepares students for positions involving the management of technology and research and development programs and projects. Students must take all courses though Old Dominion University; no transfer courses are permitted for the C.P.S. Program

Certificate Admission Requirements: Admission to graduate programs in engineering management is in accordance with the general requirements for graduate degrees as specified in the Graduate Admission section of this Catalog. Specific requirements for the Department of Engineering Management and Systems Engineering include the following:

Applicants for the C.P.S. must have a bachelor's or master's degree from an accredited institution in engineering, engineering technology, applied science or applied mathematics, and at least 27 semester hours of graduate study

approved by the graduate program director. An undergraduate GPA of at least 3.00 and a graduate GPA of at least 3.50 (on a 4.00 basis) and GRE general aptitude scores are required. Students lacking adequate academic preparation may be admitted provisionally and may be required to complete coursework in addition to the graduate admission requirements. A minimum TOEFL score of 550 is required for all international students when English is not their first language. All admitted students must submit a Plan of Study.

Certificate Requirements: The Certificate of Professional Study in Engineering Management requires the completion of 27 credit hours of post-master's course work:

Core Courses (12 credit hours): Same as courses for the Ph.D. program.
Elective courses (15 credit hours): Same requirements as the Ph.D. program.

Engineering Management Certificate

The Engineering Management Certificate Program consists of 12 credit hours of graduate-level coursework. The four courses comprising the certificate program are offered on a regular schedule to enable the completion of the program in two years. The program provides students with the necessary knowledge, skills and abilities to manage and address issues related to the design, operation, analysis, and transformation of complex problems.

Program Requirements: Admission to the Engineering Management Certificate Program requires a Bachelor's degree (or Master's) from an ABET-accredited program in applied science with a GPA of 3.00 or better for regular admission. An overall GPA of 3.00 or better is required to earn the certificate.

Required courses are ENMA 600 (Cost Estimation and Financial Analysis), ENMA 601 (Organizational Analysis), ENMA 604 (Project Management) and a choice of the following: ENMA 640 (Integrated Systems Engineering), ENMA 715 (Systems Analysis), or ENMA 724 (Risk Analysis).

Department of Mechanical Engineering

238 Kaufman Hall

757-683-6363

<http://www.eng.odu.edu/me>

Jen-Kuang Huang, Chair

Gene Hou, Graduate Program Director

Degree Programs:

The department offers the following graduate degrees:

Master of Science in Mechanical Engineering
Master of Engineering in Mechanical Engineering
Ph.D. in Mechanical Engineering
Doctor of Engineering in Mechanical Engineering

Degree Description

The Master of Science in mechanical engineering and Master of Engineering in mechanical engineering graduate programs have been designed to prepare graduates for professional practice in many facets of mechanical engineering and engineering mechanics, including teaching, research, development, design, and consulting. A graduate student in mechanical engineering may select specializations in such technical areas as fluid/thermal science, design and manufacturing, or engineering mechanics. Students are encouraged to select courses in areas, such as mathematics, physics, oceanography, engineering management, and computer science. The Mechanical Engineering Department is closely associated with area industries, consulting firms, government agencies and research laboratories, which adds relevance to the graduate engineering curricula, creating a stimulating environment for the pursuit of graduate studies. For additional information about the educational and research opportunities available please request a departmental handbook from the graduate program director.

Master's Admission Information

To qualify for admission, an applicant must first meet the general University admission requirements and earned an undergraduate degree from an accredited university in engineering, physics, or mathematics. An applicant with an overall grade point average (GPA) of 3.00 and a grade point average in the major of at least 3.00 (4.00 scale).

All students must submit Graduate Record Examination (GRE) scores. The graduate program director may waive the GRE requirement for applicants with experience or with excellent academic achievements.

For those applicants with non-engineering degrees, or with engineering degrees other than mechanical, aerospace engineering or engineering mechanics undergraduate programs must have included the subject matter prerequisite for graduate study in mechanical engineering.

Potential Background Courses for M.S. and M.E. in Mechanical Engineering:

Credits

ME 220	Engineering Mechanics II – Solid Mechanics	3
MATH 307	Ordinary Differential Equations	3
ME 303	Mechanics of Fluids	3
ME 311	Thermal Dynamics I	3
ME 312	Thermal Dynamics II	3
ME 315	Heat and Mass Transfer	3
ME 332	Mechanical Engineering Design I	3
ME 340	Computational Methods in Mechanical Engineering	3
ME 404	Vibrations	3
ME 433	Mechanical Engineering Design II	3
ME 436	Dynamic Systems and Control	3

List of Graduate Courses

ME 504	Vibrations	3
ME 506	Fluid Dynamics and Aerodynamics	3
ME 507	Motorsports Vehicle Dynamics	3
ME 511	Mechanical Engineering Power System: Theory & Design	3
ME 512	Environmental Control	3
ME 513	Energy Conversion	3
ME 514	Intro to Gas Dynamics	3
ME 516	Solar Power Engineering	3
ME 522	Modern Engineering Materials	3
ME 531	Mechanisms Analysis and Design	3
ME 538	Control System Design & Applications	3
ME 540	Introduction To Finite Element Methods	3
ME 607	Introduction to Continuum Mechanics	3
ME 608	Computational Methods in Mechanical Engineering	3
ME 610	Advanced Fluid Dynamics	3
ME 611	Advanced Classical Thermodynamics	3
ME 614	Theory and Design of Turbomachines	3
ME 615	Compressible Flow	3
ME 618	Convective Heat Transfer	3
ME 619	Conduction Heat Transfer	3
ME621	Advanced Material Science	3
ME 622	Mechanical Behavior of Materials	3
ME 623	Theory of Vibrations	3
ME 635	Computational Methods in Mechanical Engineering II	3
ME 636	Modern Control Theory	3
ME 640	Energy Utilization and Conservation	3
ME 644	Turbulent Flow I	3
ME 650	Composite Materials	3
ME 651	Experimental Stress Analysis	3
ME 654	Thermomechanical Processing of Materials	3
ME 670	Engineering Software for Computer-Aided Analysis and Design	3
ME 680	Applied Math for Design and Manufacturing	3
ME 682	Concurrent Engineering	3
ME 684	Process Re-Engineering	3
ME 686	Engineering Design with Uncertainty	3
ME 692	Manufacturing Automation	3
ME 747/847	Life Cycle Engineering	3
ME 706/806.	Modal Analysis and Identification	3
ME 713/813.	Theory of Transfer Phenomena.	3
ME 715/815.	Engineering Optimization I.	3
ME 717/817.	Turbulent Flow II.	3
ME 718/818.	Engineering Optimization II.	3
ME 734/834.	Radiation Heat Transfer.	3
ME 742/842.	Fatigue and Fracture.	3
ME 744/844.	Computer Integrated Manufacturing.	3
ME 745/845.	Contemporary Manufacturing Technology.	3
ME 746/846.	Computational Methods in Multibody Dynamics.	3

ME 748/848.	Kinematics Synthesis of Mechanisms	3
ME 757/857.	Optimal Control Theory.	3
ME 780/880.	Fundamentals of Combustion.	3
ME 790/890.	Chemically Reacting Flows.	3
ME 795/895.	Topics in Mechanical Engineering	3

Master’s Degree Requirements

The master's degree requires a minimum of 30 semester hours of work beyond the bachelor's degree with at least a B (3.00) average. At least 60% of these courses have to be 600-level and above. The core courses for the Master of Science (M.S.) and Master of Engineering (M.E.) degrees in special areas of mechanical engineering are listed in the table below.

The Master of Engineering in Mechanical Engineering (M.E.) degree is a non-thesis degree. Master of Engineering students can fulfill their degree requirement by either passing a comprehensive examination covering their course work or successfully completing a three hour project during their final semester. Students are required to pass an oral examination at the time of submission of their final project reports.

The Master of Science in mechanical engineering (M.S.) degree is a research degree requiring a thesis. The thesis constitutes six semester hours within the 30 semester hour requirements and Master of Science students are required to pass an oral examination. The department has two standardized formats for writing theses and dissertations, namely the ASME and the AIAA publication guidelines. A student, in consultation with his/her advisor, can elect to write his/her thesis or dissertation in one of the above mentioned formats. The ASME and AIAA publication guidelines can be obtained from research advisors or the graduate program director. Once a standard has been chosen, the student must conform to it throughout his/her thesis. Additional University rules are outlined in the University Thesis and Dissertation Preparation Guide.

A Master of Science degree student must have a Plan of Study Form approved by his/her thesis advisor who chairs the student's thesis committee. For a Master of Engineering degree student, he/she must have their Plan of Study Form approved by his/her faculty advisor or the graduate program director.

Comprehensive Examination for M.E. Degree

Students are required to pass a master’s comprehensive written examination in order to earn their M.E. degree. This examination is administered by the graduate program director and the Graduate Committee once every semester. Students must take this examination no later than one semester after completing their course work. The M.E. comprehensive exam is a closed book/notes test consisting of five problems from a total of five courses.

- MATH 691 or ME 680
- A core course from category two (see core course chart in Table ME-1)
- A core course from category three (see core course chart in Table ME-1)
- Two additional courses from the program of study.

Project Examination for M.E. Degree

Student selecting the project option in lieu of a comprehensive examination will be required to complete a three credit project course as part of their 30 credit hour requirement. Students choosing this option must obtain approvals from the project advisor and the graduate program director. After completion of the project, the student will complete a formal report consistent with the Master’s thesis format, defend his/her project work in a comprehensive examination by the project committee and also provide completed copies of the project to the project committee members at least 10 days prior to the examination date.

Oral Examination for M.S. Degree

Students seeking a Master of Science degree are given an oral comprehensive examination administered as a part of the student's thesis defense. The oral examination is given in two parts, a student presentation and a closed-session where the student is further questioned by the thesis committee on the thesis research, as well as on all courses taken by the student to satisfy the M.S. degree requirements.

Table ME-1. The Core Courses for Different Fields of Study

Category	Mechanical Engineering		
	Fluids/Thermal Science	Design/Manufacturing	Engineering Mechanics
1.	ME 680 or recommended by the advisor and approved by the GPD	ME 680 (Applied Math for Design and Manufacturing)	ME 680 or recommended by the advisor and approved by the GPD
2.	ME 610 (Adv. Fluids) ME 611 (Adv. Thermo) (Take at least one of the above two courses)	ME 670 (Engineering Software Applications for Adv. Design)	ME 606 (Energy Methods) ME 623 (Theory of Vibrations) ME 636 (Adv. Dynamics/Controls) (Take at least one of the above three courses)
3.	ME 615 (Compressible Flow) ME 618 (Convection) ME 619 (Conduction) (Take at least one of the above three courses)	ME 682 (Concurrent Engineering) ME 692 (Manufacturing Automation)	ME 607 (Mech. of Continuous Media)

Description of Doctor of Philosophy Degree

The Mechanical Engineering (ME) doctoral program has been designed to prepare graduates for leadership roles in the many facets of mechanical engineering including teaching, research, development, design, and consulting. A doctoral student in mechanical engineering may select specializations in such technical areas as fluid/thermal science, design and manufacturing or engineering mechanics. Students are encouraged to select courses in other areas, such as mathematics, physics, oceanography, engineering management, and computer science. The ME Department is closely associated with area industries, consulting firms, government agencies and research laboratories creating a stimulating environment for the pursuit of graduate studies.

Doctor of Philosophy Admission Requirements

To qualify for admission, applicants must meet general University admission requirements and have earned a master's degree from an accredited institution of higher education in engineering, physics, or mathematics. For those applicants with degrees in fields other than mechanical or aerospace engineering, previous course work must include prerequisite courses in either mechanical engineering or engineering mechanics. Applicants with an overall grade point average (GPA) of 3.50 on a 4.00 scale at the master's level may be admitted as a regular graduate student. An applicant with a GPA of at least 3.25 who presents an evidence for potential for improvement may be admitted as a provisional student. All students must submit their Graduate Record Examination (GRE) scores.

Doctor of Philosophy Degree Requirements

To qualify as a candidate for the Doctor of Philosophy degree with a major in mechanical engineering, a student must have completed the requirements for a master's degree in engineering, mathematics, or science that include subject matter equivalent to master's course work. A minimum of 24 semester hours of graduate-level courses beyond the master's degree must be included in the planned program, at least 60% of which should be 800-level courses. Each student is expected to spend a minimum of one academic year as a full-time student in the program. This requirement may be met while preparing the dissertation.

Preliminary Diagnostic Examination

This examination must be taken by all students in the first year before completion of 12 semester hours in the doctoral program. A student with a Master's degree in ME from ODU may be exempted from this examination if the cumulative grade point average is 3.5 or above, and the MS or ME program was completed within five years of the date of admission to the Ph.D. program. The preliminary examination covers the core courses for the master's degree in mechanical engineering and they are listed in Table ME-1. The Ph.D. Diagnostic Examination is given in the same format as the M.E. Comprehensive Examination listed above. The Ph.D. Diagnostic examination is a closed book/notes test consisting of five problems from a total of five courses including:

Either MATH 691, ME 680 or a math course recommended by the Advisory Committee and approved by the graduate program director

A core course from category two (see core course chart in Table ME-1)

A core course from category three (see core course chart in Table ME-1)

Two additional courses from the program of study.

Students are required to answer all three questions from items 1, 2 and 3, and any one of the two problems from item 4. The advisor and the Advisory Committee may recommend courses different from the above list for the Ph.D. Diagnostic Examination; however this change is subjected to the final approval of the graduate program director.

Ph.D. students are required to demonstrate reading knowledge of an approved foreign language. As an alternative, students may develop a research skill, distinct from the dissertation but fundamental to doctoral research. The findings of the research skill, written in a report form, must be approved by the advisory committee and the graduate program director. The research skill requirement must be completed before the student can take the candidacy examination.

Candidacy Examination: Students who have completed their plan of study or are taking their last course(s), and have met the research skills and writing proficiency requirements, are eligible to take the candidacy examination. The format, contents, and duration of the parts are listed below:

Part 1: A written examination covering the fundamental and specialized subjects associated with the student's emphasis;

Part 2: An oral examination covering fundamental and specialized subject examination must be approved by the graduate program director.

Dissertation

Ph.D. candidates are expected to work with their dissertation advisors to form their Dissertation Committees. A Dissertation Committee should be composed of individuals with significant knowledge related to the candidate's dissertation research. The majority of whom must be full-time faculty members of the department.

Ph.D. candidates must submit their written dissertation to the committee members at least two weeks prior to the dissertation defense. The department has two standardized formats for writing dissertations, namely the ASME and the AIAA publications guidelines. A student, in consultation with their advisor, can elect to write their dissertation in one of the above mentioned formats. Students may consult the University Thesis and Dissertation Preparation Guide for further details.

The dissertation defense consists of two parts; an open presentation to the general public and a closed examination conducted by the dissertation committee. The dissertation must be approved by the majority of the dissertation committee and must constitute a significant original contribution to the field.

Doctor of Engineering

The Department offers a Doctor of Engineering (D.Eng.) program with concentration in Mechanical Engineering in accordance with the D.Eng. program criteria and requirements specified for the Batten College of Engineering and Technology in this catalog.

Modeling and Simulation Graduate Program

1300 Engineering and Computational Sciences Building
757-683-3720

<http://eng.odu.edu/msgp/>

Roland R. Mielke, Graduate Program Director

Degree Programs:

The program offers the following graduate degrees:

- Master of Science in Modeling and Simulation
- Master of Engineering in Modeling and Simulation
- Ph.D. in Modeling and Simulation
- Doctor of Engineering in Modeling and Simulation

Description of Master's Degree

The master's degree in modeling and simulation emphasizes a strong, common subject core while providing the student with the flexibility to design a plan of study to meet each individual's study objectives and needs. The purpose of the program's subject core is to provide a common academic foundation for all simulation students. Thus, all students in this program will have grounding in the same methods, principles, and philosophy of simulation. This provides the mechanisms for the simulationist to work across disciplines and domains while maintaining a common frame of reference for

communication, technical specialization, and advanced study and research. The program's subject core consists of (1) an overview of modeling and simulation, (2) an in-depth exploration of a specific simulation methodological approach (e.g., discrete event simulation), (3) simulation system modeling principles and paradigms, (4) an introduction to computer visualization and visual simulation, and (5) principles of analysis and operations research. Most courses are offered in evenings and are in distance learning format. They are delivered to Old Dominion University's higher education centers and are available online using Polycom PVX software.

A significant resource to the program is the Virginia Modeling, Analysis and Simulation Center (VMASC). The primary purposes of VMASC include the advancement of state-of-the-art modeling and simulation through research and development and the transfer of modeling and simulation technology to industry, education, and government. Constituent interest in this center is shared by numerous industrial partners as well as local Department of Defense organizations, particularly the U.S. Joint Forces Command.

Master's Admission Requirements

The Master's Degree in Modeling and Simulation is designed for students having bachelor's degrees in Engineering, Science or Mathematics, although students from other educational backgrounds may apply with appropriate leveling courses. Prerequisites for admission include: mathematics – two courses in differential and integral calculus and one course in calculus-based probability and statistics; and computer science – algorithmic problem solving, high-level object-oriented programming language (C++ or JAVA), and data structures.

A minimum GPA of 2.80 overall and a minimum GPA of 3.0 in the undergraduate major are required. Students with notable deficiencies may be considered for provisional admission and will be required to complete prerequisite course requirements in addition to the graduate degree requirements. Job experience and training may be considered in evaluating prerequisite requirements.

Applicants should plan to submit a completed application form, transcripts from all colleges and universities attended, GRE scores (verbal, quantitative, and analytical writing), a resume and personal statement of objectives, two letters of recommendation from former university instructors, and TOEFL scores if an international applicant.

Potential prerequisite courses for the master's degrees in modeling and simulation include the following:

1. Introductory differential and integral calculus equivalent to MATH 211 (Calculus I) and MATH 212 (Calculus II).
2. Calculus-based probability and statistics; this material is available for graduate credit in ENMA 520, PSYC 727, or PSYC 728.
3. Computer science fundamentals including an object-oriented programming language such as C++ or JAVA, algorithmic problem solving, and data structures; this material is available for graduate credit in MSIM 602 (Computer Science for M&S).

Master's Degree Requirements

The Master's Degree is available as a thesis option (MS) or non-thesis option (ME); both require 30 hours of graduate credit. The Master of Science in Modeling and Simulation requires six hours of thesis credit and 24 hours of course credit. The Master of Engineering in Modeling and Simulation requires 30 hours of course credit. In both programs, 15 hours of course credit in modeling and simulation foundation courses are required. These foundation courses include:

MSIM 505	Introduction to Discrete Event Simulation (3 credits)
MSIM 601	Introduction to Modeling and Simulation (3 credits)
MSIM 605	Engineering Systems Modeling (3 credits)
MSIM 641	Visualization I (3 credits)
MSIM 651	Analysis I (3 credits)

The remaining course credits, 9 credits in the Master of Science Program and 15 credits in the Master of Engineering Program, are elective course credits. These courses are selected to achieve one or more program objectives or themes and must be approved by the graduate program director. Such themes might include military M&S, medical M&S, human computer interfacing, distributed simulation, human behavior modeling, simulation interoperability, or other themes reflecting M&S applications or sub-areas. Elective courses can include courses offered by colleges other than Engineering.

Description of Doctor of Philosophy Degree

The Ph.D. in Modeling and Simulation program focuses on developing the necessary skills and knowledge to enable the graduate to conduct and evaluate independent, original research in an area of modeling and simulation. The goal of the program is to prepare students for careers in teaching and research at academic institutions, as well as the conduct or leadership of research and development in public and private organizations.

Doctor of Philosophy Admission Requirements

Admission to the Ph.D. program with a concentration in modeling and simulation is made in accordance with Old Dominion University and Batten College of Engineering and Technology requirements for doctoral programs as specified in this Catalog. Specific additional requirements for the modeling and simulation concentration include the following:

1. Completion of a master's degree in an appropriate and closely related field is expected. However, students who have completed 24 credits of graduate courses in an appropriate field from an accredited institution may petition for direct admittance to the program.
2. A minimum GPA in graduate course work of 3.50 (out of 4.0) is required of most students. A student with a GPA greater than 3.25 and with evidence of a high level of professional capability in the field of modeling and simulation may be eligible for admission to the program upon submission of a petition to the graduate program director.
3. Recent scores (typically, not more than five years old) on the Graduate Record Examination's (GRE) verbal, quantitative, and analytical writing sections must be submitted by all applicants.
4. Three letters of recommendation (typically at least two of which are from faculty in the highest degree program completed when the application is within five years of graduation from that degree program) are required.
5. The applicant must submit a statement of purpose, goals, and objectives related to the program and a resume.

Applicants are expected to have the following foundation knowledge:

1. Mathematics fundamentals including differential and integral calculus, ordinary differential equations, calculus-based probability and statistics, and linear algebra.
2. Computer science fundamentals including an object-oriented programming language such as C++ or JAVA, algorithmic problem solving, and data structures.
3. Knowledge of the content of the foundation courses required in the Modeling and Simulation Master's Program.

Doctor of Philosophy Degree Requirements

The Ph.D. in modeling and simulation is offered in accordance with the general requirements for doctoral degrees as specified in the Requirements for Graduate Degrees Section of this Catalog. Specific program of study requirements for the concentration in modeling and simulation include the following:

1. Completion of a minimum of 72 hours of graduate credits to include: a maximum of 24 credits of course work from the master's degree; a minimum of 24 credits of course work beyond the master's degree; and a minimum of 24 credits of dissertation research.
2. Successful completion of a written diagnostic examination before completion of nine credits of advanced course work.
3. Successful completion of a written and oral qualifying examination near the completion of the course work.
4. Successful presentation of a dissertation research proposal at the beginning of the dissertation research.
5. The successful completion and public defense of a dissertation representing independent, original research worthy of publication in a peer-reviewed scholarly journal.

The program of study for the Modeling and Simulation program is developed with the approval of the graduate program director and the student's advisor. The program shall include a minimum of 24 credit hours of course work beyond the master's degree distributed as follows.

Common Core - 12 credits

MSIM 820	Continuous and Real-Time Simulation (3 credits)
MSIM 830	Simulation Foundations (3 credits)
MSIM 842	Visualization II (3 credits)
MSIM 852	Analysis II (3 credits)

Electives - Minimum of 12 credits of elective courses that provide a basis for dissertation research. No more than six credits from course work satisfying

foundation knowledge requirements may be included in the program of study for elective credit. At least three-fifths (15 credits) of non-dissertation course work must be at the 800-level.

Description of Doctor of Engineering Degree

The D. Eng. In Modeling and Simulation program focuses on developing the advanced skills and knowledge to enable the graduate to conduct and lead advanced technical projects in an engineering environment. It affords engineering practitioners the opportunity to achieve advanced graduate education beyond the master's degree.

Doctor of Engineering Admission Requirements

Admission to the D. Eng. Program with a concentration in modeling and simulation is made in accordance with Old Dominion University and Batten College of Engineering and Technology requirements for doctoral programs as specified in this catalog. Specific admission requirements are identical to the admission requirements for the Doctor of Philosophy program with a concentration in modeling and simulation.

Doctor of Engineering Degree Requirements

The D. Eng. in modeling and simulation is offered in accordance with the D. Eng. degree requirements as specified for the Batten College of Engineering and Technology in this catalog. Specific program of study requirements for the concentration in modeling and simulation include the following.

1. Completion of a minimum of 72 hours of graduate credits to include: a maximum of 24 credits of course work from the master's degree; a minimum of 18 credits of core professional courses; a minimum of 18 credits of core and elective technical courses; and a minimum of 12 credits of applied doctoral project.
2. Successful completion of a written diagnostic examination before completion of nine credits of advanced course work.
3. Successful completion of a written and oral qualifying examination near the completion of the course work.
4. Successful presentation of a project concept proposal.
5. Successful presentation and public defense of the completed project. The project should be worthy of publication in a peer-reviewed scholarly journal.

The program of study for the Modeling and Simulation program is developed with the approval of the graduate program director and the student's advisor. The program shall include a minimum of 18 credits of professional course work and 18 credits of technical core course work beyond the master's degree distributed as follows.

Professional Core Courses

- | | |
|--|-----------|
| 1. ENGN 604: Project Management | 3 credits |
| 2. ENGN 611: Financial Engineering | 3 credits |
| 3. ENGN 612: Engineering Corporate Management | 3 credits |
| 4. ENGN 811: Methodologies for Advanced Engineering Projects | 3 credits |
| 5. ENGN 812: Engineering Leadership | 3 credits |
| 6. ENGN 813: Engineering Ethics | 3 credits |

Technical Core Courses

- | | |
|--|-----------|
| 1. MSIM 820: Continuous and Real-Time Simulation | 3 credits |
| 2. MSIM 830: Simulation Foundations | 3 credits |
| 3. MSIM 842: Visualization II | 3 credits |
| 4. MSIM 852: Analysis II | 3 credits |
| 5. Two (2) approved technical elective courses | 6 credits |

No more than three credits from course work satisfying foundation knowledge requirements may be included in the program of study for technical elective credit. At least three-fifths of the non-project coursework must be at the 800-level.

Enterprise Centers

The Batten College of Engineering and Technology is a catalyst for the economic development of Hampton Roads. To this end, the college has established a number of centers to serve as engines for enterprise development. These centers utilize all University resources, including students and faculty.

Applied Research Center (ARC)

Hani Elsayed-Ali, Director

ARC is an advanced materials engineering and laser technology research center. Staffed with industry/university teams utilizing the Jefferson Lab technologies, ARC provides commercial product-related research in the areas of thin film technology, laser and plasma processing of materials, materials analysis, and devices and sensor fabrication. For more information: www.eng.odu.edu/arc.

Center for Advanced Engineering Environments (CAEE)

Ahmed K. Noor, Director

CAEE serves as a focal point for the diverse research activities pertaining to distributed collaborative synthesis and learning technologies and their application to future aerospace systems. These activities include the synergistic coupling of modeling, visual simulations, intelligent agents, multimedia and synthetic environments, human-computer interactions, computational intelligence, and computational, information and collaboration technologies in the multidisciplinary analysis, sensitivity studies, optimization, design and operation of future aerospace systems. For more information: www.caee.odu.edu.

Langley Full-Scale Wind Tunnel (LFST)

Robert L. Ash, Director

LFST is a full-scale facility for aerodynamic testing of ground, air, and sea vehicles and structures. LFST is the largest university-operated wind tunnel in the world. For more information: www.lfst.com

Mid-Atlantic Regional Spaceport (MARS)

Billie Reed, Executive Director

MARS, formerly the Virginia Space Flight Center (VSFC), is a full-service, FAA-licensed spaceport. The state-owned spaceport is located on the NASA Wallops Flight Facility on Virginia's Eastern Shore, an ideal site for access to the International Space Station. MARS provides low-cost access to mid-inclination and sun synchronous orbits for small- to medium-class expendable launch vehicles with payloads up to 12,000 pounds. For more information: www.marsspaceport.com

Virginia Applied Technology and Professional Development Center (VATPDC)

Jerry B. Robertson, Director

VATPDC, formerly the Technology Applications Center for Continuing Engineering Education, identifies and focuses University resources on engineering practice, management, and training. Activities include prototyping, customized testing, manufacturing process improvements, product development, sales and marketing, strategic planning, and performance benchmarking. Training subject areas include engineering management, Lean principles, Six Sigma, network administration and engineering, and information technology. For more information: www.vatpdc.com

Research Institutes

Coastal Engineering is part of the college's Department of Civil and Environmental Engineering. Its mission is to foster interdisciplinary educational and research opportunities for faculty and students interested in applied coastal science and engineering. David R. Basco, Director

Experimental Aeronautics is part of the college's Department of Aerospace Engineering. Its mission is to support facility-related workforce training and research, principally related to wind tunnels to develop and mature the experimental methods program emphasis within the Department of Aerospace Engineering, and to act as an academic adjunct to the Langley Full Scale Wind Tunnel operation. Colin P. Britcher, Director

Lean Institute was established to find solutions for issues related to enterprise productivity. The institute also addresses issues related to other business functions such as supply chain logistics, technology management, human resources, design, and contracting. Alok K. Verma, Chief Technologist

Institute for Multidisciplinary Parallel and Vector Computations promotes interactions (and/or collaborations) among researchers in the areas of engineering applications, large scale computations, and parallel software and algorithm developments. Duc T. Nguyen, Director

National Centers for System of Systems Engineering (NCSOSE) is a collection of independent, nonprofit, engineering research and application organizations, government entities, and universities that have joined together with a common goal to solve problems, develop technologies, and direct research focused on critical issues related to the integration of complex systems of systems. Charles Keating, Director

Laser and Plasma Engineering Institute is focused on conducting fundamental and applied research using laser and plasma technologies. The LPEI provides state-of-the-art equipment and a vibrant academic environment where faculty and graduate and undergraduate students engage together in advanced research encompassing fundamental and applied research aspects in the fields of Surface Science, Interaction of Laser with Matter, Plasma Synthesis of Nanomaterials, and the Physics and Applications of Cold Plasmas. Director: Dr. Mounir Laroussi

Transportation Research Institute collaborates with centers and departments across the ODU campus to conduct innovation-based research in the core areas of transportation operations, transportation safety, transportation planning, freight transportation, and environment, energy, and sustainable transport. Director: Asad Khattak

Ship Maintenance, Repair and Operations Institute works to make ship repair and operations more cost effective, while meeting or exceeding environmental requirements. Han Bao, Director

Sustainable Development Institute was established in 2004, in association with the Department of Civil and Environmental Engineering, to promote and provide engineering, ecological, environmental, and economic assistance to local, regional, and national governmental agencies, as well as international organizations and businesses. The institute actively participates in community service by conducting waste minimization and pollution prevention assistance to local businesses. Mujde Erten-Unal, Director

Batten College of Engineering Graduate Courses

Course Prefixes

Aerospace Engineering—AE

Civil and Environmental Engineering — CEE

Electrical and Computer Engineering — ECE

Engineering — ENGN

Engineering Management — ENMA

Engineering Management Systems Engineering — EMSE

Civil Engineering Technology — CET

Electrical Engineering Technology — EET

Mechanical Engineering Technology — MET

Mechanical Engineering — ME

Modeling and Simulation — MSIM

Aerospace Engineering — AE

AE 403/503. Flight Mechanics.

Lecture 3 hours; 3 credits. Prerequisites: AE 406, ME 436. Aircraft concepts including performance prediction and optimization, flight and maneuver envelopes, and steady flight performance. Additional topics: longitudinal static stability and trim; aircraft dynamics; development, separation and solution of aircraft equations of motion; natural modes; dynamic stability; sensors and actuators; and design of stability augmentation and autopilot systems.

AE 406/506. Flight Vehicle Aerodynamics. Lecture 3 hours; 3 credits. Prerequisites: ME 303, 312, 340. Inviscid flow concepts including: Euler equations, stream function, velocity potential, singularities, vorticity and circulation laws. Viscous flow topics including boundary layers, separation, and turbulent flow. In addition, external flows, lift and drag, thin airfoil theory, finite wing theory and airfoil design will be discussed.

AE 407/507. Ground Vehicle Aerodynamics. Lecture 3 hours; 3 credits. Prerequisite: ME 303 or MET 330 or CEE 330. Review of basic fluid mechanics principles pertaining to the incompressible flow of air. Introduction to bluff body aerodynamics, production and performance (race car) automotive aerodynamics, as well as truck and bus aerodynamics. Discussion of experimental and computational methods for evaluating vehicle aerodynamic performance. Discussion of the optimization of high performance vehicle design for low drag and/or high downforce and the facilities and techniques required. Introduction to the aerodynamics of other surface vehicles such as sailboats and trains. Lecture and wind tunnel experiments.

AE 417/517. Propulsion Systems. Lecture 3 hours; 3 credits. Prerequisite: ME 312 or 414. Basic principles of design, operation and performance of propulsion systems - including turbojet, turboprop, turbofan, and ramjet engines. Introduction to chemical rockets, ion and plasma thrusters.

AE 420/520. Aerospace Structures. Lecture 3 hours; 3 credits. Prerequisite: ME 332. Analysis of aircraft and space vehicle structural components. Effects of bending, torsion and shear on typical aerospace structural components, statically indeterminate beams, shear center and shear flow. Introduction to typical aerospace structures. Introduction to composite structures.

AE 440/540. Introduction to Space Systems Engineering. Lecture 3 hours; 3 credits. Prerequisites: MATH 307 and PHYS 232N.

Introduction to spacecraft systems starting from mission design and space environment considerations and proceeding through propulsion, attitude control, spacecraft structural design, thermal control, power and communications for spacecraft.

AE 457/557. Motorsports Vehicle Dynamics. Lecture 2 hours; laboratory 3 hours; 3 credits. Prerequisites: ME 205 and MATH 307. Basic mechanics governing vehicle dynamic performance. Analytical methods in vehicle dynamics. Laboratory consists of various vehicle dynamics tests on model vehicles and full-size racecars. (cross-listed with ME 407/507)

AE 467/567. Racecar Performance. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisites: AE 407/507 and 457/557. On-track performance of typical racecars (Legends and Baby Grand) to demonstrate and evaluate the interplay between vehicle aerodynamics, suspension system geometry adjustments, tire selection and operating pressure on overall racecar performance and handling. Laboratory testing via on-board instrumentation during skid pad and road course evaluation; computer simulation to investigate various car set-ups.

AE 472/572. Statistical Foundations for Experimenters. Lecture 3 hours; 3 credits. Prerequisite: MATH 311. Introduction to applied statistics for engineers and experimenters. Descriptive statistics for data analysis, introduction to probability, frequency distributions and sampling. Hypothesis testing and confidence intervals of one and two sample problems. ANOVA, one-factor experimental designs, fixed and random effects, multiple comparisons, correlation and regression analysis, control charts. Application to aerospace testing.

AE 477/577. High Performance Piston Engines. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisites ME 312, 315 or MET 300, 350. A study of the fundamental principles and performance characteristics of spark ignition and diesel internal combustion engines. Overview of engine types and their operation, engine design and operating parameters; ideal and semi-empirical models of engine cycles; combustion, fluid flow and thermal considerations in engine design and performance. Laboratory evaluation of engine performance using flow and dynamometer systems. (cross-listed with MET 480)

AE 495/595. Topics in Aerospace Engineering and Engineering Mechanics. 1-3 credits. Prerequisite: permission of the instructor. Special topics of interest with emphasis placed on recent developments in aerospace engineering or engineering mechanics.

AE 497/597. Independent Study in Aerospace Engineering and Engineering Mechanics. 1-3 credits. Prerequisite: permission of the instructor. Individual analytical, computational, and/or experimental study in an area selected by student. Supervised and approved by the advisor.

AE 601. Introduction to Continuum Mechanics. Lecture 3 hours; 3 credits. Indicial notations and tensor calculus; strain and stress tensors, rate of deformation tensor, Eulerian and Lagrangian descriptions, conservation principles, constitutive formulations for elastic solids and viscous fluids, formulation of fluid mechanics and solid mechanics problems. Simple applications. (Cross-listed with ME 607.)

AE 602. Fluid Dynamics and Aerodynamics. Lecture 3 hours; 3 credits. Prerequisite: AE 601. Conservation laws for viscous and inviscid flows.

Formulation of fluid problems. Analytical and numerical solutions of viscous flow problems. Boundary-layer approximations, Self-similar solutions, Two- and three-dimensional potential flows with applications to airfoils and wings. Introduction to hydrodynamic stability and turbulence. (Cross-listed with ME 610)

AE 603. Energy and Variational Methods in Structural Mechanics. Lecture 3 hours; 3 credits. Corequisite: MATH 691. Concepts of energy and variational methods, calculus of variations, variational principles of structural mechanics, Castigliano's Theorems. Approximate methods of solution, applications to bars, beams and plates. Linear stress, buckling and vibration problems. (Cross-listed with ME 606.)

AE 604. Analytical Dynamics of Aerospace Vehicles. Lecture 3 hours; 3 credits. Advanced kinematics with moving reference frames. Coordinate transformation matrices. Euler equations of motion. Gyroscopic systems and gyroscopic instrument theory. Elementary missile dynamics. Principle of virtual work, D'Alembert's principle, Hamilton's principle, Lagrange's Equations of Motion.

AE 605. Applied Engineering Analysis. Lecture 3 hours; 3 credits. Applications of linear algebra, ordinary and partial differential equations, and complex variables to engineering problems in structural dynamics, applied automatic control and aerodynamics.

AE 606. Real-time Signals and Systems. Lecture 3 hours; 3 credits. Signals and transforms for real-time systems. Applications to modal analysis, experimental aerodynamics, and real-time control.

AE 611. Supersonic Aerodynamics. Lecture 3 hours; 3 credits. Prerequisite: AE 602. Governing equation for supersonic flow, Crocco's Theorem, entropy production, Euler limit equations, full potential equation; classification of PDEs governing subsonic, supersonic and transonic flows; first- and second-order small disturbance theory, airfoil flows, slender bodies of revolution flows, conical flows, wing flows.

AE 620. Computational Fluid Dynamics I. Lecture 3 hours; 3 credits. Prerequisite: MATH 691. Classification of single PDE's; finite difference methods; stability analysis, convergence, consistency, efficiency; basics of finite volume methods; model equations of hyperbolic, parabolic and elliptic type; explicit and implicit schemes, central and upwind schemes, weak solutions of quasi-linear hyperbolic equations.

AE 621. Experimental Aerodynamics. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisites: AE 406 or 602, AE 611 or ME 414. Techniques for static and dynamic measurement of pressure, temperature, and velocity. Experiment control, statistical treatment of data. Probe methods, including multi-hole pressure probes and hot-wire anemometers. Non-intrusive methods, including Laser Doppler Velocimetry and other optical methods. Surface and stream flow visualization. Surface measurements.

AE 622. Aerospace Test Facilities. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Comprehensive examination of aerodynamic test facilities for use in subsonic, transonic, supersonic and hypersonic flow regimes. Aspects of wind tunnel design and operation. Flow quality. Wall and support interferences. Advanced concepts, including cryogenic wind tunnels, adaptive wall test sections and magnetic suspension. Dynamic testing. Review of flight

test methods, including extraction of aerodynamic parameters from flight test data. Review of engine test facilities. Review of ground test facilities for space structures and other space systems.

AE 627. Aerodynamics for Motorsports. Lecture 1.5 hours; laboratory 3 hours; 3 credits. Prerequisite: AE 407/507. Wind tunnel operations and test methods for aerodynamic evaluation and development of race cars. Modern design of experiments and use of advanced diagnostic methods. Small-scale tests of models and full-scale test of characteristic vehicles.

AE 631. Aerospace Structures. Lecture 3 hours; 3 credits. Prerequisite: AE 605 or MATH 691. Classical and high-order theories of plates. Navier and Levy solution procedures. Applications to isotropic and orthotropic plates. Differential geometry and curvilinear coordinates. Membrane theory of shells. Shells of revolution. Applications to isotropic shells.

AE 633. Flight Vehicle Structural Analysis. Lecture 3 hours; 3 credits. Prerequisite: MATH 691. Aircraft loads estimation. Review of basic elasticity. Stress functions, Prandtl stress function, St. Venant warping, membrane analogy. Bending, shear, and torsion of open and closed, thin-walled cross sections. Analysis of tapered beams with application to fuselages and wings, cutouts, end constraints. Introduction to composite materials.

AE 634. Structural Vibrations I. Lecture 3 hours; 3 credits. Prerequisites: MATH 691 and ME 404. Natural modes of discrete and continuous systems; closed form and approximate methods; free and forced responses. Theory of modal analysis and approximate methods for undamped and damped systems; transform and wave solutions. Finite element methods. Structural vibrations under combined loading. Introduction to non-linear vibrations. Applications to rods, beams, plates and shells. (Cross-listed with ME 623)

AE 637. Tires and Brakes Performance. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisite: AE 457/557. Empirical characterization of essential tire properties and discussion of tire construction, terminology and axis system. Cornering properties and friction circle. Relevance of tire performance to overall vehicle performance.

AE 638. Applied Analog and Digital Control. Lecture 3 hours; 3 credits. Prerequisite: ME 436, ECE 461 or equivalent. Computer-aided analysis and design of practical control systems. Introduction to state-space, digital signal processing and digital control. Laboratory sessions on aliasing, analog control, system identification, and real-time control.

AE 640. Finite Element Analysis I. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Mathematical concepts of finite element analysis. Variational approach based on weak-form solutions to partial differential equations. Basic concepts of interpolation functions, continuity, discretization and assembly. Applications to 1-D and 2-D problems of engineering. (cross-listed with CEE 711/811 and ME 635)

AE 641. Experimental Structural Dynamics. Lecture 1 hour; laboratory 4 hours; 3 credits. Prerequisite: AE 634. Experimental techniques and methods for structural dynamics and modal analysis. Instrumentation utilization including electrodynamic shakers, impact hammers, accelerometers, laser vibrometers, signal analyzers, signal filters, and force transducers. Time and frequency domain data acquisition, assessment, and

post-processing. Development of mathematical models from experimental data.

AE 647. Racecar Structures and Materials Design. Lecture 3 hours; 3 credits. Prerequisite: ME 440/540. Synthesis and analyses of complex structures that are characteristic of contemporary racecar design practices. Materials properties and selection criteria and process. Stiffness and crashworthiness influence on design. Fabrication methods.

AE 650. Modern Control Theory. Lecture 3 hours; 3 credits. Prerequisite: ME 436. Formulation of state space equations governing dynamics and stability of linear systems. Controllability; observability. State feedback control design. Optimal control methods. State observers and estimators. (Cross-listed with ME 636.)

AE 657. Performance Sensors and Analysis. Lecture 1 hour; laboratory 4 hours; 3 credits. Principles of installing sensors, wiring, connections, logger units, and telemetry devices. Data analysis for improving engine, chassis, and driver performance.

AE 660. Aerospace Vehicle Performance. Lecture 3 hours; 3 credits. Prerequisites: AE 406 or 602, ME 414 or AE 611. A study of the flight performance of aerospace vehicles. Review of aerodynamic and propulsion characteristics. Range, flight and maneuver envelopes for vehicles in atmospheric flight. Introduction to methods of design and trajectory optimization. Design and performance of launch vehicles. Open-ended, design-oriented project work.

AE 662. Flight Control Actuators and Sensors. Lecture 3 hours; 3 credits. Prerequisites: AE 403, 438 and 604. Overview of governing principles and operations of actuator and sensor hardware used in aircraft and spacecraft flight control systems. Hydraulic, electro-hydraulic and electric actuators. Control jets and momentum wheels. Accelerometers and rate gyros. Air-Data systems. Inertial navigation systems and satellite navigation systems. Dynamic model development, analysis, and simulation. Nonlinear hardware characteristics and the influence on closed-loop vehicle behavior.

AE 667. Cooperative Education in Aerospace Engineering. 1-3 credits. Prerequisite: permission of the instructor. Work or other professional career-related experience of a limited duration and highly applicable to aerospace engineering or engineering mechanics.

AE 668. Internship in Aerospace Engineering. 1-3 credits. Prerequisite: permission of the instructor. Work or other professional career-related experience of a limited duration and highly applicable to aerospace engineering or engineering mechanics.

AE 669. Practicum in Aerospace Engineering. 1-3 credits. Prerequisite: permission of the instructor. Work or other professional career-related experience of a limited duration and highly applicable to aerospace engineering or engineering mechanics.

AE 672. Design of Experiments. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisite: AE 472/572. Formal experiment design. Review of relevant statistics. ANOVA, multiple comparisons, residuals and modal adequacy checking. Randomized complete block designs, factorial designs, 2^k factorial and fractional factorial designs, random and mixed effects in factorials, optimization, introduction to response surface methods. Laboratory exercises use designed experiments applied to aerospace testing,

including wind tunnel testing and instrument calibration.

AE 677. Drivetrain Design and Performance. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisite: AE 477/577. Introduction to operation and design of high performance vehicle transmission and differential systems. Considers the matching of race car engines, transmission gearing, chassis geometry, and track characteristics for best performance.

AE 684. Virtual and Synthetic Environments and Applications. Lecture 3 hours; 3 credits. A systematic introduction to the foundation of Virtual Environments, including human perception, displays, interaction techniques, software and design principles; overview of Virtual Environments application areas; a course project on engineering or science applications.

AE 687. Team Dynamics and Leadership. Lecture 3 hours; 3 credits. Develop group leadership skills and learn how to recognize and effectively use group dynamics in motorsports management. Demonstrations and simulations are experiential methods for student participation.

AE 690. Aerospace Engineering Seminar. Lecture 1 hour; 1 credit. Regular tutorials on recent topics of interest in Aerospace Engineering and Engineering Mechanics.

AE 691. Experimental Research Project. Laboratory 6 hours; 3 credits. Prerequisite: permission of the instructor. An independent laboratory experience in the area of either aerodynamics, structural dynamics or applied automatic control. Results will be reported in a format and quality similar to a technical conference paper.

AE 692. Team Summary Project. Lecture 2 hours; laboratory 8 hours; 6 credits. Prerequisite: departmental approval required. Provides experience of working as part of a team to design a racecar or significant component to specific performance requirements, including cost and schedule goals. Project will include fabrication and demonstration of goals. Emphasis on teamwork and communications skills. Brief introductory content regarding project management and use of computer based tools.

AE 695. Topics in Aerospace Engineering. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Special topics of interest with emphasis placed on recent developments in aerospace engineering or engineering mechanics.

AE 697. Independent Study in Aerospace Engineering. 3 credits. Prerequisite: permission of the instructor. Individual analytical, computational and/or experimental study in an area selected by the student. Supervised and approved by the advisor.

AE 698. Master's Project. 1-6 credits. Prerequisite: permission of the instructor.

AE 699. Thesis Research in Aerospace Engineering. 1-6 credits. Prerequisite: permission of the instructor. Thesis research in aerospace engineering or engineering mechanics leading to the Master of Science degree.

AE 709/809. Boundary-Layer Theory. Lecture 3 hours; 3 credits. Prerequisite: AE 602. Boundary layer equations; method of matched asymptotic expansions; body oriented coordinates, finite-difference solutions; separations, wake and jet flows; thermal and compressible boundary layers, transformations and finite-difference solutions, unsteady boundary layers. Introduction to hydrodynamic stability and turbulence.

AE 710/810. Transonic Aerodynamics. Lecture 3 hours; 3 credits. Prerequisite: AE 611. Singular surfaces under the Euler limit; transonic breakdown of linearized theory; transonic expansion procedures; transonic small disturbance theory; transonic slender bodies, similarity rules; hodograph equation; transonic far fields; relaxation schemes; unsteady transonic flows, three-dimensional wings; finite difference methods.

AE 711/811. Hypersonic Aerodynamics. Lecture 3 hours, 3 credits. Prerequisite: AE 611. General consideration of hypersonic flow and similarity principles, hypersonic flow past slender bodies with sharp and blunt leading edges. Hypersonic blunt-body flow. Real gas, viscous and low density effects, and consideration of nonequilibrium phenomena in hypersonic flows.

AE 712/812. Unsteady Aerodynamics and Aeroelasticity. Lecture 3 hours; 3 credits. Prerequisites: AE 602, 611, and 634. Oscillating airfoils in incompressible, Subsonic and supersonic flows; Arbitrary airfoil motion, Oscillating finite wings; Unsteady motion of finite wings; Unsteady motion of nonlifting bodies; Aeroelastic phenomena; Static and dynamic loads, divergence, control reversal, flutter, dynamic response.

AE 713/813. Turbulence Modeling. Lecture 3 hours; 3 credits. Prerequisites: AE 602 and 709/809. Isotropic and homogeneous turbulence. Mixing length theories, Equilibrium turbulence models, Two-equations models (k-epsilon). Large-eddy simulation. Reynold's stress transport models. Numerical simulations. Compressible and non-equilibrium turbulence effects. (Cross-listed with ME 644)

AE 714/814. Aerodynamic Flow Control. Lecture 3 hours; 3 credits. Prerequisites: AE 602 and 720/820. Introduction and definitions, Goals, Passive and active control methodologies and techniques, Flow separation control, Drag reduction control techniques, Flow transition control, Micro-electrical-mechanical Systems (MEMS) control, Future challenges.

AE 720/820. Computational Fluid Dynamics II. Lecture 3 hours; 3 credits. Corequisite: AE 602. Prerequisite: AE 620. Classification of systems of PDE's; mathematical nature of Euler equations; conservative form of the Navier-Stokes equations; grid generation; central difference schemes; finite volume schemes; upwind flux-vector, flux-difference and TVD schemes; boundary conditions.

AE 731/831. Mechanics of Composite Structures. Lecture 3 hours; 3 credits. Prerequisite: AE 601. Stress-strain relations for a lamina; failure theories. Micro-mechanical behavior of a lamina. Constitutive relations of a laminate. Bending, buckling and vibration of laminated plates. Approximate and finite element methods of solution.

AE 732/832. Thermal Stress Analysis. Lecture 3 hours; 3 credits. Prerequisite: AE 601. Formulation of thermoelasticity problems for elastic materials. Solution methods for two- and three-dimensional thermo-elastic problems. Computational and finite element methods.

AE 733/833. Nonlinear Aerospace Structures. Lecture 3 hours; 3 credits. Prerequisites: AE 631 and 634. Classical and finite element analysis methods for nonlinear aerospace structures of beams, plates, and shallow shells. Application to problems of large bending deflection, thermal post-buckling, large amplitude free vibration, nonlinear panel flutter, and nonlinear random response.

AE 734/834. Structural Vibrations II. Lecture 3 hours; 3 credits. Prerequisite: AE 634. Stationary random processes: autocorrelation and spectral density; ergodic processes and temporal statistics. Structures with single degree-of-freedom. Response of multi-degree-of-freedom and continuous systems. Estimating service life. Introduction to nonlinear vibrations of structures.

AE 740/840. Finite Element Analysis II. Lecture 3 hours; 3 credits. Prerequisite: AE 640. Application of variational methods to structural mechanics. General finite element development procedures including symbolic computations. Finite element formulations based on alternate variational principles. Applications to plate bending, buckling and vibration. Introduction to non-linear problems.

AE 744/844. Active Control of Structures. Lecture 3 hours; 3 credits. Prerequisites: AE 634 and 650. Fundamentals of structural dynamics, control systems, and digital signal processing. Conventional and adaptive control methods applied to vibrating structural systems. Integration of spatial-temporal signal processing techniques. Modeling and characterization of transduction devices, distributed strain actuators-sensors, and smart materials. Relationships between physical, modal, and wave domain models for structural dynamics and control. Feedforward-Feedback control, control of waves in structures, theory and implementation of active and passive vibration isolation systems, active control of structurally radiated sound.

AE 750/850. Autonomous and Robotic System Analysis and Control. Lecture 3 hours; 3 credits. Kinematics, dynamics and control of complex non-linear electro-mechanical systems, particularly robotic manipulators.

AE 760/860. Atmospheric Flight Dynamics and Control. Lecture 3 hours; 3 credits. Prerequisites: AE 403, 650. Principles governing the dynamics and control of vehicles in atmospheric flight. Equations of motion development and solution including inertial/gravitational/aerodynamic/propulsive loads, linear longitudinal and lateral-directional motions, and nonlinear trim and simulation. Flight control system design and analysis incorporating flying quality requirements, linear conventional/temporary and frequency/time-domain techniques for control and guidance functions, validation with nonlinear simulation, gain scheduling.

AE 761/861. Space Flight Dynamics and Control. Lecture 3 hours; 3 credits. Prerequisites: AE 604, 650. Principles governing the dynamics and control of vehicles in space flight. Equations of motion development and solution including inertial/gravitational/propulsive loads, decoupled translational and attitude motions. Orbital mechanics including elements, initial-value propagation, adjustments/transfers, Lambert boundary-value problem, perturbations, and nonlinear simulation. Attitude dynamics including torque free, gravity moment, axisymmetric/unsymmetric vehicles, and dual spinners. Flight control system design and analysis including impulsive velocities, finite burns, Lambert targeting, linear design using momentum wheels, and nonlinear phase-plane design using thrusters.

AE 763/863. Advanced Control Methodologies. Lecture 3 hours; 3 credits. Prerequisite: AE 650. Review of multivariable dynamic math models including state space, transfer function, and matrix fractions. Multivariable design criteria including stability,

performance, and robustness. Theory and application of multivariable control design techniques including LQR/LQG/LTR, Hoo, Eigenspace Assignment and other advanced methods.

AE 772/872. Response Surface Methodology. Lecture 3 hours; 3 credits. Prerequisite: AE 672. An applied course in response surface methodology with aerospace applications. Empirical model building, method of least squares, second order models, model adequacy checking, canonical analysis. Method of steepest ascent, multiple response optimization. Rotatable, cuboidal and small run designs. Design optimality and efficiency metrics, robust design, restrictions on randomization. Laboratory exercises include RSM applied to wind tunnel testing and optimization.

AE 780/880. Perturbation Methods in Aerospace Engineering. Lecture 3 hours; 3 credits. Method of multiple scales, derivative expansion, two scales method, generalized method; solvability conditions, acoustic waves in ducts, vibrations of nearly circular membranes, general fourth-order PDE; methods of averaging, KB and KBM methods; canonical variables, Lagrangian and Hamiltonian, applications in vibration and wave motion.

AE 783/883. Aeroacoustics. Lecture 3 hours; 3 credits. Prerequisite: AE 611. Equations of aeroacoustic wave propagation; aerodynamic sources; acoustic analogy; effects of uniform and nonuniform flow; duct acoustics; linearization; introduction to numerical simulation, boundary conditions and time-series analysis.

AE 784/884. Multidisciplinary Design and Optimization. Lecture 3 hours; 3 credits. Prerequisite: AE 720/820 or 740/840. Formulation of fluids/dynamics interaction problems, Initial and boundary conditions, Frames of reference, Methods of solution, Formulation of fluid/dynamics/control interaction problems, Initial and boundary conditions, Methods of solution, Unconstrained minimization, Constraints, Sensitivity analysis, Optimization and coupling.

AE 785/885. Magnetic Suspension Technology. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Review of electromagnetic suspension and levitation systems. Maxwell's equations, low frequency approximations, magnetic materials, stresses, forces and moments, Earnshaw's theorem. Passive and active magnetic suspension, electrodynamic levitation. Sensors, controller design and implementation, power supplies, electromagnet design. Magnetostatic and magnetodynamic modeling, computational methods.

AE 795/895. Topics in Aerospace Engineering. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Special topics of interest with emphasis placed on recent developments in aerospace engineering or engineering mechanics.

AE 797/897. Independent Study in Aerospace Engineering. 3 credits. Prerequisite: permission of the instructor. Individual analytical, computational and/or experimental study in an area selected by the student. Supervised and approved by the advisor.

AE 899. Dissertation Research in Aerospace Engineering. 1-9 credits. Prerequisite: permission of the instructor. Dissertation research in aerospace engineering or engineering mechanics leading to the doctoral degree.

AE 999. Aerospace Engineering 999. 1 credit. A one-hour pass/fail registration required

of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Civil and Environmental Engineering — CEE

CEE 411/511. Concrete Design II. Lecture 3 hours; 3 credits. Prerequisite: CEE 410 or equivalent. Analysis and design of complex concrete structural members, flat and two-way slabs, special topics and introduction to prestressed concrete design.

CEE 414/514. Masonry Structures Design. Lecture 3 hours; 3 credits. Prerequisite: CEE 310. Masonry materials, reinforced beams and lintels, walls, columns and pilasters, shear walls, and buildings.

CEE 415/515. Steel Structures Design. Lecture 3 hours; 3 credits. Prerequisite: CEE 310. Load and resistance factor design methods for steel structures.

CEE 416/516. Wood Structures Design. Lecture 3 hours; 3 credits. Prerequisite: CEE 310. Design of wood structures based on national design specification and load and resistance factor design.

CEE 430/530. Foundation Engineering. Lecture 3 hours; 3 credits. Prerequisite: CEE 323. Subsurface exploration, site preparation, design of shallow and deep foundations, and retaining structures.

CEE 431/531. Earth Structures Design with Geosynthetics. Lecture 3 hours; 3 credits. Prerequisite: CEE 323. Seepage and stability analysis and design of manmade and natural slopes and retaining structures. Applications of geosynthetic material to seepage control, reinforcement of earth works, and containment of hazardous materials.

CEE 432/532. Introduction to Earthquake Engineering. Lecture 3 hours; 3 credits. Prerequisites: senior standing and permission of the instructor. An overview of earthquake processes and details of the characteristics of destructive ground motion; the effects of such motion on civil engineering structures; reviews of current design practice in mitigating earthquake hazards for various civil engineering structures such as buildings, bridges, dams, lifelines, ports and harbors.

CEE 440/540. Hydraulic Engineering. Lecture 3 hours; 3 credits. Prerequisite: CEE 340. Hydraulic transients; flow control structures; computer analysis of hydraulic systems; design of pipelines, open channels and culverts.

CEE 446/546. Urban Stormwater Hydrology. Lecture 3 hours; 3 credits. Prerequisite: CEE 340. Storm rainfall analysis, design rainfall hyetographs, runoff calculation procedures, detention basins, use of mathematical models to analyze and design urban storm drainage systems.

CEE 447/547. Groundwater Hydraulics. Lecture 3 hours; 3 credits. Prerequisite: CEE 340. Description of well hydraulics in single and multiple well systems. Determination of aquifer parameters from pumping tests. Use of computer models to determine drawdowns due to multiple well systems.

CEE 450/550. Water Distribution and Wastewater Collection System Design. Lecture 3 hours; 3 credits. Prerequisite: CEE 330. Corequisite: CEE 340. Design of water distribution systems, sanitary sewer systems and appurtenances.

CEE 452/552. Air Quality. Lecture 3 hours; 3 credits. Prerequisite: CEE 250 or 350. Study of air quality management standards and regulations and pollutant dynamics. Design and operation of emission control equipment for mobile and stationary sources of air pollution.

CEE 454/554. Hazardous Wastes. Lecture 3 hours; 3 credits. Prerequisite: CEE 250 or 350. Study of sources, generation rates and characteristics of hazardous wastes and their regulation, handling, and design of treatment and disposal facilities.

CEE 458/558. Sustainable Development. Lecture 3 hours; 3 credits. Prerequisite: junior standing or permission of instructor. Overview of social, economical, technical environmental aspects of regional, national and international efforts to achieve sustainable development. Discussion of the integration of industrial activity and ecological concerns utilizing principles of zero emissions, pollution prevention and design for the environment.

CEE 470/570. Transportation Fundamentals. Lecture 3 hours; 3 credits. Prerequisite: senior standing. This course surveys the current practice of transportation engineering in the United States. It focuses on various ground transportation modes and covers policy, institutional planning and operational issues. Students are introduced to planning models, capacity analysis, traffic impact analysis, and parking studies.

CEE 471/571. Transportation Operations I. Lecture 3 hours; 3 credits. Prerequisite: CEE 470/570. This is the first course in transportation operations and traffic flow theory. Topics include traffic engineering studies, capacity analysis, intersection control, traffic flow models, shockwave analysis, signal warrant analysis, and safety analysis. Course includes applications of modeling and simulation to isolated intersections.

CEE 476/576. Transportation Operations Applications. Lecture 3 hours; 3 credits. Prerequisite: CEE 470. This course deals with operations applications in transportation. It covers theory and practical examples of traffic engineering studies, capacity analysis, intersection control, signal warrant analysis, and safety analysis. Topics discussed also include traffic management, access management, traffic calming, and regional operations management.

CEE 482/582. Introduction to Coastal Engineering. Lecture 3 hours; 3 credits. Prerequisites: CEE 330 and permission of the instructor. Classical small amplitude wave theory, wave transformations in shallow water, shoaling, refraction, diffraction, reflection, breaking. Wave induced near shore currents and sediment transport processes. Alternatives to mitigate coastal erosion processes. Introduction to coastal structures.

CEE 495/595. Topics in Civil and Environmental Engineering. Lecture 1-3 hours; 1-3 credits. Prerequisite: Permission of the department chair. Special topics of interest with emphasis placed on recent developments in civil and/or environmental engineering.

CEE 646. Contingency Readiness and Facility Management with GIS. Lecture 3 hours; 3 credits. Fundamentals of GIS-based, spatiotemporal facility management concept with event/response planning and prioritization. Organization and optimization methods of event-specific data flow for contingency readiness and decision rubric simulation. Engineering approach to spatial database schema design and control.

CEE 650. Pollution Prevention. Lecture 3 hours; 3 credits. Application of engineering

methods to the prevention of pollution. Review of the Pollution Prevention Act and related regulations. Study of source reduction methods analysis for manufacturing, materials, and processing changes. Pollution prevention case studies.

CEE 653. Environmental Engineering Law. Lecture 3 hours; 3 credits. Prerequisite: permission of instructor. Provides an introduction to the American legal system in the context of environmental law. Examines the close interrelationships among science, engineering, technology and the law. Develops perspectives on environmental protection and the law.

CEE 667. Cooperative Education. 1-3 credits (may be repeated for credit). Prerequisite: approval by the department and Career Management in accordance with the policy for granting credit for cooperative education programs. Available for pass/fail grading only. Student participation for credit based on the academic relevance of the work experience, criteria, and evaluative procedures as formally determined by the department and Career Management prior to the semester in which the work experience is to take place.

CEE 668. Internship. 1-3 credits. Prerequisite: approval by department and Career Management Center. Academic requirements will be established by the department and will vary with the amount of credit desired. Allows students an opportunity to gain short duration career-related experience.

CEE 669. Practicum. 1-3 credits. Prerequisite: approval by department and Career Management Center. Academic requirements will be established by the department and will vary with the amount of credit desired. Allows students an opportunity to gain short duration career-related experience.

CEE 695. Topics in Civil and Environmental Engineering. Lecture 1-3 hours; 1-3 credits. Prerequisite: Permission of the department chair. Special topics of interest with emphasis placed on recent developments in civil and/or environmental engineering.

CEE 697. Independent Study in Civil and Environmental Engineering. 1-3 credits. Prerequisite: permission of the instructor. Individual analytical, experimental and/or design study selected by the student. Approved and supervised by the advisor.

CEE 698. Master's Project. 1-3 credits. Individual project, investigation under the direction of the student's major professor.

CEE 699. Thesis Research. 1-6 credits. Research leading to the Master of Science thesis.

CEE 700/800. Civil and Environmental Engineering Experimental Design. Lecture 3 hours; 3 credits. Graduate-level overview of engineering experimental design and analysis with emphasis on statistical methods; practical and proper statistical methods applicable to multidisciplinary, real-world civil and environmental engineering problems.

CEE 710/810. Structural Dynamics. Lecture 3 hours; 3 credits. Free and forced vibration of discrete and continuous systems; elastic and inelastic response of structures under dynamic loads.

CEE 711/811. Finite Element Analysis. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. To provide an understanding of the finite element method (FEM) as derived from an integral formulation perspective. To demonstrate the solutions of (1-D

and 2-D) continuum mechanics problems such as solid mechanics, fluid mechanics and heat transfer. (Crosslisted with AE 640 and ME 635)

CEE 712/812. Advanced Reinforced Concrete. Lecture 3 hours; 3 credits. Ultimate-strength theory, yield line methods, limit design, and other relevant advanced topics in the theory and design of concrete structures.

CEE 713/813. Prestressed Concrete. Lecture 3 hours; 3 credits. Analysis and design of prestressed concrete members and structures. Shrinkage, creep and losses, shear, bond and anchorages are discussed.

CEE 714/814. Advanced Structural Analysis. Lecture 3 hours; 3 credits. Elastic analysis of framed structures using matrix and numerical techniques.

CEE 715/815. Engineering Optimization I. Lecture 3 hours; 3 credits. Formulation and solution algorithms for Linear Programming (LP) problems. Unconstrained and constrained nonlinear programming (NLP) problems. Optimum solution for practical engineering systems. (Cross-listed with ME 715/815.)

CEE 717/817. Bridge Structures Design. Lecture 3 hours; 3 credits. Prerequisites: CEE 410 and 415/515 or equivalent. Design of steel, concrete, and composite bridges using modern techniques and current specifications.

CEE 718/818. Engineering Optimization II. Lecture 3 hours; 3 credits. Prerequisite: CEE 715/815 or ME 715/815. Sensitivity analysis of discrete systems; sensitivity analysis of distributed systems; dual methods for constrained optimization; optimization decomposition, multi-level optimization and recent developments in engineering optimization. (Cross-listed with ME 718/818)

CEE 719/819. Inelastic Structures. Lecture 3 hours; 3 credits. Inelastic analysis and behavior of framed structures.

CEE 720/820. Structural Stability. Lecture 3 hours; 3 credits. Fundamentals of elastic and inelastic stability of beams, columns and frames.

CEE 721/821. Plates. Lecture 3 hours; 3 credits. Classical and modern methods for the solution of plates of various shapes and boundary conditions, continuous and axially loaded plates and plates on elastic supports. Design examples.

CEE 722/822. Cluster Parallel Computing. Lecture 3 hours; 3 credits. Detailed numerical step-by-step procedures to exploit parallel and sparse computation under MPI (Message, Passing, Interface) computer environments are explained. Large-scale engineering/science applications are emphasized. Simultaneous linear equations are discussed.

CEE 723/823. Seismic Design of Steel Structures. Lecture 3 hours; 3 credits. Prerequisite: CEE 310 or equivalent. Analysis and design of steel structures under seismic loading conditions, introduction to design specifications for steel structures.

CEE 724/824. Retrofitting methods for Bridges and Buildings. Lecture 3 hours; 3 credits. Prerequisite: CEE 310 or equivalent. Retrofitting methods for bridges and buildings combined with related advanced structural analysis and design techniques.

CEE 730/830. Advanced Foundation Engineering. Lecture 3 hours; 3 credits. Prerequisite: CEE 430/530. Advanced analysis and design of shallow and deep foundations and retaining structures.

CEE 731/831. Advanced Soil Mechanics. Lecture 3 hours; 3 credits. Prerequisite: CEE 323.

Detailed study of shear strength of soils and its application to slope stability and embankment design and analysis. Advanced laboratory shear tests are included.

CEE 732/832. Engineering Behavior of Soils. Lecture 3 hours; 3 credits. Prerequisite: CEE 323. Detailed study of physiochemical behavior of soils, fabric, rheology, effective stress path, and their applications to various geotechnical engineering problems.

CEE 733/833. Soil Dynamics. Lecture 3 hours; 3 credits. Prerequisite: CEE 323. Study of soil behavior under dynamic loadings. Laboratory and field techniques for determining soil properties and liquefaction potential. Design examples.

CEE 741/841. Open Channel Flow. Lecture 3 hours; 3 credits. Prerequisite: CEE 340. Momentum and energy principles, design of open channels, use of mathematical models for flow calculations in rivers, introduction to unsteady open channel flow.

CEE 747/847. Groundwater Flow. Lecture 3 hours; 3 credits. Prerequisite: CEE 340. Mathematical formulations of laws governing groundwater flow and contaminant transport. Unsaturated flow. Use of computer models for modeling groundwater aquifers.

CEE 751/851. Physicochemical Treatment Processes. Lecture 3 hours; 3 credits. Prerequisite: CEE 350. Physical and chemical processes used in the treatment of water and waste water are covered. Separation, isolation and reaction processes are characterized as well as reactor engineering.

CEE 752/852. Biological Wastewater Treatment. Lecture 3 hours; 3 credits. Prerequisite: CEE 350. The use of microorganisms to treat domestic and industrial waste waters for organics and nutrient removal are studied. Characteristics of individual waste water components and the appropriate treatment processes to remove these components are covered.

CEE 753/853. Advanced Processes for Water and Wastewater Treatment. Lecture 3 hours; 3 credits. Prerequisites: CEE 751 and 752. Theory, operation and application of advanced water and waste water treatment systems, including land application, dissolved solids, organic contaminant and nutrient removal processes. Emphasis on system development for waste water reclamation/recycling.

CEE 754/854. Environmental Engineering Microbiology. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisite: CEE 350. A lecture and laboratory course dealing with the study of the principles and applications of microbiology in waste water treatment, water treatment, stream self-purification and their effects in environmental engineering.

CEE 755/855. Water Quality Management. Lecture 3 hours; 3 credits. Characterization of water quality in natural systems and the human activities that result in contaminant input to these systems are studied. Management practices for minimizing contaminant input and for restoring contaminated waters are discussed.

CEE 756/856. Water Quality Modeling Lecture 3 hours; 3 credits. Prerequisites: MATH 307, CEE 340, CEE 350 or permission of the instructor. Formulation of mathematical equations to describe the fate and transport of aqueous contaminants in dynamic surface water systems. Use of water quality computer models to predict various contamination scenarios.

CEE 761/861. Water Resources Systems Analysis. Lecture 3 hours; 3 credits. Application

of systems analysis and project evaluation techniques to water resource problems including water demand forecasting, reservoir design and operation, groundwater management and water distribution system design.

CEE 762/862. Aquatic Chemistry in Environmental Engineering. Lecture 3 hours; 3 credits. Prerequisite: CHEM 117. Chemical reactions in natural and engineered systems are studied with emphasis placed on developing kinetic expressions and assessing chemical equilibrium. Kinetic and equilibrium expressions are applied to engineering problems to predict the reaction time and products of specific reactions.

CEE 770/870. Transportation Safety. Lecture 3 hours; 3 credits. Prerequisite: CEE 470/570 and CEE 471/571. This course focuses on major transportation safety issues including transportation safety goals, safety of various transportation modes, identification of problematic locations, selection of safety countermeasures and their evaluation, safety data and modeling issues.

CEE 771/871. Transportation Operations II. Lecture 3 hours; 3 credits. Prerequisite: CEE 470/570 and CEE 471/571. This is the second course in transportation operations and traffic flow theory. Topics covered include design of progressive signal systems, queuing theory, car following models, and applications of microscopic traffic simulation to corridor studies.

CEE 772/872. Intelligent Transportation Systems. Lecture 3 hours; 3 credits. Prerequisite: CEE 470/570. This course examines how ITS can be used to enhance mobility and safety. The topics covered in the course include systems engineering approach to ITS, traveler response to technologies and information, ITS planning and evaluation, and ITS deployment and operational performance.

CEE 774/874. Transportation Planning. Lecture 3 hours; 3 credits. Prerequisite: CEE 470 or equivalent. This course covers transportation planning processes that include policy direction, transportation data, travel demand forecasting models, and decision-making/stakeholders issues.

CEE 775/875. Transportation Network Models and Optimization. Lecture 3 hours; 3 credits. This course is designed to show the broad applicability of network modeling techniques to the problems of designing and operating various transportation systems. Topics to be covered include fundamentals of graph theory, routing algorithm network flow problems, assignment and matching problems, facility location problems, and relevant optimization techniques.

CEE 776/876. Simulation Modeling in Transportation Networks. Lecture 3 hours; 3 credits. Principles of simulation modeling. Microscopic, mesoscopic and macroscopic traffic simulation models. Driver behavior in networks. Calibration and validation of traffic simulation models. Traffic simulation software.

CEE 782/882. Design of Coastal Structures. Lecture 3 hours; 3 credits. Prerequisite: CEE 482/582. Nonlinear wave theories; wave forces on slender piles and seawalls; design of rubblemound structures; design philosophy, initial costs, maintenance costs, optimized design using stochastic methods; design of renourished beaches. Advanced alternative solutions for shore protection.

CEE 787/887. Dredging and Beach Engineering. Lecture 3 hours; 3 credits. Prerequisite: CEE 330. Types of dredges, factors affecting dredge performance; hydraulic dredges (cutter, hopper) and mechanical dredges systems (bucket, clamshell, etc.); shoaling rate

determination; inlet sand bypassing systems; beach renourishment schemes. Design of beach renourishment/projects.

CEE 788/888. Coastal Hydrodynamics and Sediment Transport Processes. Lecture 3 hours; 3 credits. Prerequisite: CEE 482/582. Time averaging wind waves and radiation stresses. Wave setup, longshore currents, rip currents and nearshore circulation. Theoretical models for regular (monochromatic) and irregular waves. Wave energy dissipation models in surf zones. Vertical structure and undertow models. Sediment concentration and transport models for predicting bathymetric change.

CEE 789/889. Computational Environmental Fluid Dynamics. Lecture 3 hours; 3 credits. Prerequisite: CEE 330. Fluid dynamics conservation laws as transport phenomena. Classical, finite-difference models for advection, diffusion and combined fluid flows. Explicit and implicit schemes to solve unsteady, free-surface fluid flow and diffusion (dispersion) problems in one and multi-dimensions. Turbulence models.

CEE 795/895. Topics in Civil and Environmental Engineering. Lecture 1-3 hours; 1-3 credits. Prerequisite: Permission of the department chair. Special topics of interest with emphasis placed on recent developments in civil and/or environmental engineering.

CEE 892. Doctor of Engineering Project. 1-9 credits. Directed individual study applying advanced level technical knowledge to identify, formulate, and solve a complex, novel problem in Civil and Environmental Engineering.

CEE 897. Independent Study in Civil and Environmental Engineering. 1-3 credits. Prerequisite: permission of the instructor. Individual analytical, experimental and/or design study selected by the student. Approved and supervised by the advisor.

CEE 899. Dissertation Research. 1-9 credits.

CEE 999. Civil Engineering 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Electrical and Computer Engineering — ECE

ECE 403/503. Power Electronics. Lecture 3 hours; 3 credits. Prerequisites: MATH 307 and ECE 303. Power electronics is an enabling technology, providing the needed interface between the electrical source and the electrical load, and facilitating the transfer of the power from the source to the load by converting voltages and currents from one form to another. Topics include: RMS voltage and power, alternating voltage rectification, DC converters, Buck, Boost, Buck-Boost, Cuk and SEPIC converters; discontinuous conduction mode and continuous conduction mode; negative feedback control in power electronics; voltage control and current control; isolated switching mode power supply; flyback and forward power supply; solid state switches; Thyristor converter; motor and DC motor; brushed motor and brushless motor.

ECE 405/505. Introduction to Discrete Event Simulation. Lecture 3 hours; 3 credits. Prerequisites: undergraduate course in probability and statistics; computer literacy. An introduction to the fundamentals of discrete event simulation (DES). Topics include discrete event simulation methodology, development of simulation modes,

simulation verification and validation, and the design of simulation experiments. Important statistical concepts, including selection of input probability distribution and output data analysis are developed and applied. A DES tool will be used to create, simulate and analyze self-defined projects. (cross listed with MSIM 405/505)

ECE 406/506. Introduction to Visualization. Lecture 3 hours; 3 credits. Prerequisite: a grade of C or better in CS 150. Introduction to computer graphics and visualization with emphasis on using 3D application programmer's interface (API) libraries. It covers mathematical foundations, rendering pipeline, geometrical transformations, 3D viewing and projections, shading, texture mapping, and programmable shaders. Various visualization applications are covered.

ECE 407/507. Introduction to Game Development. Lecture 3 hours; 3 credits. Prerequisite: CS 361 or equivalent. An introductory course focused on game development theory and practices using Microsoft XNA Game Studio with emphasis on educational game development. Topics covered include game architecture, computer graphics theory, user interaction, audio, high level shading language, animation, physics, and artificial intelligence. Students will develop games related to science (e.g., physics, chemistry, and biology), technology, engineering, and mathematics (STEM) education. The developed games can run on a variety of platforms, including Microsoft Windows, Xbox 360, and Zune Digital Media Player.

ECE 441/541. Advanced Digital Design and Field Programmable Gate Arrays. Lecture 3 hours; 3 credits. Prerequisite: ECE 341. Course will provide a description of FPGA technologies and the methods using CAD design tools for implementation of digital systems using FPGAs. It provides advanced methods of digital circuit design, specification, synthesis, implementation and prototyping. It introduces practical system design examples. (Offered spring)

ECE 443/543. Computer Architecture. Lecture 3 hours; 3 credits. Corequisites: ECE 304 and 489W. Prerequisites: ECE 341, 346. An introduction to computer architectures. Analysis and design of computer subsystems including central processing units, memories and input/output subsystems. Important concepts include datapaths, computer arithmetic, instruction cycles, pipelining, virtual and cache memories, direct memory access and controller design. (offered fall)

ECE 451/551. Communication Systems. Lecture 3 hours; 3 credits. Prerequisites: ECE 304 and a grade of C or better in ECE 202. Fundamentals of communication systems engineering using analog and digital techniques. Modulation methods including continuous waveform modulation (amplitude, angle) and introduction to digital transmission. Design of modulation systems and the performance in the presence of noise. Communication simulation exercises through computer experiments.

ECE 452/552. Introduction to Wireless Communication Networks. Lecture 3 hours; 3 credits. Prerequisite: ECE 304 and a grade of C or better in ECE 202. Introduction to current wireless network technologies and standards. The radio spectrum and radio wave propagation models (pathloss, fading, and multipath). Modulation, diversity, and multiple access techniques. Wireless network planning and operation. Common wireless standards and emerging technologies (wireless sensor and ad-hoc networks).

ECE 454/554. Introduction to Bioelectrics. Lecture and design 3 hours; 3 credits. Prerequisites: PHYS 111N or higher; MATH 200 or higher. A one-semester course covering the electrical properties of cells and tissues as well as the use of electrical and magnetic signals and stimuli in the diagnosis and treatment of disease. Typical topics to be covered include basic cell physiology, endogenous electric fields in the body, electrocardiography, cardiac pacing, defibrillation, electrotherapy, electroporation, electrotherapy in wound healing. In addition, ultrashort electrical pulses for intracellular manipulation and the application of plasmas to biological systems will be covered. (Cross-listed with ENGN 454/554)

ECE 455/555. Network Engineering and Design. Lecture and design 3 hours; 3 credits. Prerequisite: ECE 355 or permission of the instructor. This course is an extension of ECE 355 into a semester long project. Emphasis is on gaining an understanding of networking design principles that entails all aspects of the network development life cycle. Topics include campus LAN models and design, VLANs, internetworking principles and design, WAN design, design of hybrid IP networks, differentiated vs. integrated services, traffic flow measurement and management. (offered spring)

ECE 458/558. Instrumentation. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisites: PHYS 102N, 112N, or 232N, and a grade of C or better in ECE 202. Computer interfacing using a graphical programming language with applications involving digital-to-analog conversion (DAC), analog-to-digital conversion (ADC), digital input output (DIO), serial ports, and the general-purpose instrument bus (GPIB). Analysis of sampled data involving the use of the probability density function, mean and standard derivations, correlations, and the power spectrum. (offered spring, summer)

ECE 461/561. Automatic Control Systems. Lecture 3 hours; 3 credits. Prerequisite: a grade of C or better in ECE 202. Analysis and design of control systems via frequency and time domain techniques. Root locus, Bode and Nyquist techniques. Pole placement through state variable feedback. Stability, sensitivity, and performance specifications. Cascade and feedback compensation.

ECE 462/562. Introduction to Medical Image Analysis (MIA). Lecture 3 hours; 3 credits. Prerequisite: a grade of C or better in MATH 212. Introduction to basic concepts in medical image analysis. Medical image registration, segmentation, feature extraction, and classification are discussed. Basic psychophysics, fundamental ROC analysis, and FROC/DROC methodologies are covered.

ECE 472/572. Plasma Processing at the Nanoscale. Lecture 3 hours; 3 credits. Prerequisite: ECE 323. The science and design of partially ionized plasma and plasma processing devices used in applications such as etching and deposition at the nanoscale. Gas phase collisions, transport parameters, DC and RF glow discharges, the plasma sheath, sputtering, etching, and plasma deposition.

ECE 473/573. Solid State Electronics. Lecture 3 hours; 3 credits. Prerequisites: ECE 313, 323 and 332. The objective of this course is to understand basic semiconductor devices by understanding semiconductor physics (energy bands, carrier statistics, recombination and carrier drift and diffusion) and to gain an advanced understanding of the physics and fundamental

operation of advanced semiconductor devices. Following the initial introductory chapters on semiconductor physics, this course will focus on p-n junctions, metal-semiconductor devices, MOS capacitors, MOS field effect transistors (MOSFET) and bipolar junction transistors.

ECE 474/574. Optical Communications. Lecture 3 hours; 3 credits. Prerequisites: ECE 323 and MATH 312. Electromagnetic waves; optical sources including laser diodes; optical amplifiers; modulators; optical fibers; attenuation and dispersion in optical fibers; photodectors; optical receivers; noise considerations in optical receivers; optical communication systems.

ECE 478/578. Lasers and Laser Applications in Engineering. Lecture 3 hours; 3 credits. Prerequisites: ECE 313 and MATH 312. Applications of lasers in various areas of engineering will be addressed. Relevant aspects of laser engineering and design will be covered. Topics include interaction of light with matter; non-intrusive optical diagnostic techniques; and applications of lasers in engineering, technology, science and medicine.

ECE 480/580. Introduction to Imaging Applications for Homeland Security. Lecture 3 hours; 3 credits. Prerequisite: a grade of C or better in ECE 202. Introduction to fundamentals of imaging technologies used in Homeland Security, including visible, infrared, ultrasound, X-ray, and terahertz. Models and applications of technologies. Discussion of visible imagery for security applications and use of image enhancement techniques augmented by implementation using MATLAB.

ECE 481/581. Introduction to Digital Image Processing. Lecture 3 hours; 3 credits. Prerequisite: a grade of C or better in ECE 202 or permission of the instructor. This course introduces the fundamentals of digital image/picture processing in the MATLAB environment. Techniques in spatial and spatial-frequency domains are discussed and implemented for image enhancement and compression.

ECE 482/582. VLSI System Design. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisites: ECE 313 and a grade of C or better in ECE 241. This course focuses on the transistor level design of Very Large Scale Integrated (VLSI) chips for complex digital systems using advanced design tools and hierarchical design methods. Design issues at layout, schematic, logic and register-transfer levels will be studied. Commercial design software will be used for laboratory exercises. An overview of VLSI computer-aided design (CAD) tools and theoretical concepts in VLSI architectures and algorithms will also be discussed.

ECE 483/583. Embedded Systems. Lecture 3 hours; 3 credits. Prerequisite: ECE 346. This course covers fundamentals of embedded systems: basic architecture, programming, and design. Topics include processors and hardware for embedded systems, embedded programming and real time operating systems.

ECE 495/595, 496/596. Topics in Electrical and Computer Engineering. Lecture 1 to 3 hours; 1 to 3 credits each semester. Prerequisite: departmental approval.

ECE 601. Linear Systems. Lecture 3 hours; 3 credits. Prerequisite: MATH 307. A comprehensive introduction to the analysis of linear dynamical systems from an input-output and state space point of view. Concepts from linear algebra, numerical linear algebra and linear operator theory are used throughout. Some

elements of state feedback design and state estimation are also covered.

ECE 605. Engineering Systems Modeling. Lecture 3 hours; 3 credits. Prerequisites: MATH 307 and one course on probability or statistics. The goal of this course is to develop understanding of the various modeling paradigms appropriate for conducting digital computer simulation of many types of systems. The techniques and concepts discussed typically include concept graphs, Bayesian nets, Markov models, Petri nets, system dynamics, Bond graphs, cellular automata, Lsystems, and parallel and distributed simulation systems. Students will report on a particular technique and team to implement a chosen system model. (cross listed with MSIM 605)

ECE 606. Visualization I. Lecture 3 hours; 3 credits. Prerequisite: Linear Algebra, C and C++ programming, and calculus. Practical treatment of visualization and computer graphics with emphasis on usage of application programming interface (API) libraries. It covers mathematical foundations, rendering pipeline, geometrical transformations, 3D viewing and projections, shading, texture mapping, programmable shaders, scene graph, procedural methods and physical methods.

ECE 607. Machine Learning I. Lecture 3 hours; 3 credits. Prerequisite: Graduate Standing. Course provides a practical treatment of design, analysis, implementation and applications of algorithms. Topics include multiple machine learning models: linear models, neural networks, support vector machines, instance-based learning, Bayesian learning, genetic algorithms, ensemble learning, reinforcement learning, unsupervised learning, etc.

ECE 612. Digital Signal Processing. Lecture 3 hours; credits 3. Prerequisite: ECE 200E, CE 381, or equivalent. This course will present the fundamentals of discrete-time signal processing. Topics will include time domain signals and discrete-time linear systems, continuous-time signal sampling and reconstruction, the Discrete Fourier Transform (DFT), the Z-transform, FIR and IIR digital filter design, and digital filter implementations. Applications and examples of DSP usage will be discussed. Problem solving using MATLAB is required.

ECE 623. Electromagnetism. Lecture 3 hours; 3 credits. Prerequisite: ECE 323 or equivalent. Review of electrostatic and magnetostatic concepts, time varying field, Maxwell's equations, plane wave propagation in various media, transmission lines, optical wave guides, resonant cavities, simple radiation systems, and their engineering applications.

ECE 630. Advanced Bioelectrics. Lecture 3 hours; 3 credits. Prerequisite: Bachelor's degree in physics, engineering, or biology. A one-semester course covering advanced topics in bioelectrics. The course will cover advanced applications of pulsed power and plasma in the medical, biological and environmental fields. (Cross-listed with ENGN 630)

ECE 642. Computer Networking. Lecture 3 hours; 3 credits. Prerequisites: ECE 355 and 455 or permission of the instructor. The course is based on the ISO (International Standard Organization) OSI (Open Systems Interconnection) reference model for computer networks. A focus is placed on the analysis of protocols at different layers, network architectures, and networking systems performance analysis. Current topic areas include LANs, MANs, TCP/IP networks, mobile communications, and ATM.

ECE 643. Computer Architecture Design. Lecture 3 hours; 3 credits. Prerequisite: ECE 443/543. Digital computer design principles. The course focuses on design of state-of-the-art computing systems. An emphasis is placed on superscalar architectures focusing on the pipelining and out-of-order instruction execution operations.

ECE 648. Advanced Digital Design. Lecture 3 hours; 3 credits. Prerequisite: ECE 341. This course introduces methods for using high level hardware description language such as VHDL and/or Verilog for the design of digital architecture. Topics include top-down design approaches, virtual prototyping, design abstractions, hardware modeling techniques, algorithmic and register level design, synthesis methods, and application decomposition issues. Final design project is required.

ECE 651. Statistical Analysis and Simulation. Lecture 3 hours; 3 credits. Prerequisites: MATH 307 and one undergraduate course in probability or statistics. An introduction to probabilistic and statistical techniques for analysis of signals and systems. This includes a review of probability spaces, random variables, and random processes. Analysis and simulation of systems with random parameters and stochastic inputs are considered.

ECE 652. Wireless Communications Networks. Lecture 3 hours; 3 credits. Prerequisites: ECE 451/551 or permission of instructor. Fundamental concepts in wireless communication systems and networks: radio waveform propagation modeling (free-space, reflections and multipath, fading, diffraction and Doppler effects); physical and statistical models for wireless channels; modulation schemes for wireless communications and bandwidth considerations; diversity techniques; MIMO systems and space-time coding; multiuser systems and multiple access techniques (TDMA, FDMA, CDMA); spread spectrum and multiuser detection; introduction to wireless networking and wireless standards; current and emerging wireless technologies.

ECE 653. Pulsed Power. Lecture 3 hours; 3 credits. Prerequisites: PHYS 232N, MATH 307, ECE 313 and 323. Introduction into generation, diagnostics, and application of high power electrical pulses. Topics: power conditioning, energy storage devices, pulse power components and systems.

ECE 667. Cooperative Education. 1-3 credits. Available for pass/fail grading only. Student participation for credit based on academic relevance of the work experience, criteria, and evaluative procedures as formally determined by the department and the Cooperative Education/Career Management program prior to the semester in which the work experience is to take place.

ECE 668. Internship. 1-3 credits. Prerequisite: approval by department and Career Management. Academic requirements will be established by the department and will vary with the amount of credit desired. Allows students an opportunity to gain short duration career related experience. Meant to be used for one-time experience. Work may or may not be paid. Project is completed during the term.

ECE 669. Practicum. 1-3 credits. Prerequisite: approval by department and Career Management. Academic requirements will be established by the department and will vary with the amount of credit desired. Allows students an opportunity to gain short duration career related

experience. Student is usually already employed - this is an additional project in the organization.

ECE 677. Introduction to Nano Materials: Synthesis, Properties and Applications. Lecture 3 hours; 3 credits. Prerequisites: ECE 332 or ECE 473. This course deals with synthesis of various nano materials that have important electrical, optical and magnetic properties. Examples of their applications will be discussed. It also provides details of manufacturing of nano materials such as metals nano clusters, semiconductors and nano engineering bulk materials.

ECE 682. Analog VLSI. Lecture 3 hours; 3 credits. Prerequisite: ECE 313. A survey of some fundamental topics in analog VLSI including current mirrors, amplifiers, frequency response, noise feedback, stability, and operational amplifiers. Projects on design of CMOS operational amplifiers including the use of Cadence design tools for simulation and layout. Students are expected to have some knowledge or experience with analog electronics.

ECE 695. Topics in Electrical or Computer Engineering. Lecture 3 hours; 3 credits. This course will be offered as needed, depending upon the need to introduce special subjects to target specific areas of master's-level specializations in electrical or computer engineering.

ECE 699. Thesis. 1-9 credits. Prerequisite: departmental approval. Directed research for the master's thesis.

ECE 731/831. Graduate Seminar. Lecture 1 hour; 1 credit. Prerequisite: graduate standing. Graduate seminar presentations concerning technical topics of current interest given by faculty and invited speakers.

ECE 742/842. Computer Communication Networks. Lecture 3 hours; 3 credits. Prerequisite: ECE 642 or permission of instructor. This is an advanced level course in data communications. A focus is placed on the analysis, modeling, and control of computer communication systems. Topics include packet switched networks, circuit switched networks, ATM networks, network programming, network control and performance analysis, network security, and wireless sensor networks.

ECE 762/862. Digital Control Systems. Lecture 3 hours; 3 credits. Prerequisites: ECE 461/561, 481/581 and 601. Mathematical representation, analysis, and design of discrete-time and sampled-data control systems. Topics include transfer function and state space representations, stability, the root locus method, frequency response methods, and state feedback.

ECE 763/863. Multivariable Control Systems. Lecture 3 hours; 3 credits. Prerequisites: ECE 461/561 and 601. A comprehensive introduction to techniques applicable in control of complex systems with multiple inputs and outputs. Both the frequency domain and state variable approaches are utilized. Special topics include robust and optimal control.

ECE 766/866. Nonlinear Control Systems. Lecture 3 hours; 3 credits. Prerequisites: ECE 461/561 and 601. An introduction to mathematical representation, analysis, and design of nonlinear control systems. Topics include phase-plane analysis, Lyapunov stability theory for autonomous and nonautonomous systems, formal power series methods and differential geometric design techniques.

ECE 774/874. Semiconductor Characterization. Lecture 3 hours; 3 credits. Prerequisite: ECE 473/573 or equivalent. Introduction of basic methods for semiconductor

material and device characterization. Topics include resistivity, carrier doping concentration, contact resistance, Schottky barrier height, series resistance, channel length, threshold voltage, mobility, oxide and interface trapped charge, deep level impurities, carrier lifetime, and optical, chemical and physical characterization.

ECE 775/875. Non-thermal Plasma Engineering. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. This course covers the fundamental principals governing low temperature plasma discharges and their applications. First the fundamental properties of plasmas are introduced. These include the kinetic theory of gases, collisional processes, and plasma sheaths. Then in-depth coverage of the physical mechanisms underlying the operation of non-equilibrium plasma discharges is presented, including important characteristics such as their ignition, evolution, and eventual quenching. Finally, practical applications of non-thermal plasmas, including applications in biology and medicine, are presented.

ECE 777/877. Semiconductor Process Technology. Lecture 3 hours; 3 credits. Prerequisite: ECE 473/573. Theory, design and fabrication of modern integrated circuits that consist of nano scale devices and materials. Topics include crystal growth and wafer preparation process including epitaxy, thin film deposition, oxidation, diffusion, ion implantation, lithography, dry etching, VLSI process integration, diagnostic assembly and packaging, yield and reliability.

ECE 779/879. Principles and Applications of Laser Engineering. Lecture 3 hours; 3 credits. Prerequisite: ECE 478/578. Interaction of radiation with matter, spontaneous and stimulated emission, absorption. Gain in a laser medium. Laser pumping schemes. Linear and non-linear laser plus propagation. Non-linear processes include harmonic generation, wave mixing and Raman scattering. Short laser pulse production. Current application of lasers in science and technology.

ECE 780/880. Machine Pattern Analysis. Lecture 3 hours; 3 credits. Prerequisites: ECE 601 and 651. Basic principles and strategies for pattern processing and recognition systems. Parametric and non-parametric techniques including Bayesian classifiers and neural networks. Analysis of linear and nonlinear decision function for pattern classification. Trainable pattern classifiers with statistical data sets.

ECE 781. Imaging Technologies for Homeland Security. Lecture 3 hours; 3 credits. Prerequisites: Calculus and Linear Algebra. This course introduces the fundamentals of various imaging technologies that are used in Homeland Security applications, including Visible, Infrared, Ultrasound, X-ray, and Terahertz. Models for the different technologies will be discussed vis-à-vis their application to homeland security. Visible imagery will be examined in detail for reconnaissance and surveillance. Joint use of data for image and information fusion or security applications will also be examined.

ECE 782/882. Advanced Digital Signal Processing. Lecture 3 hours; 3 credits. Prerequisite: ECE 612 or equivalent. Review of time domain and frequency domain analysis of discrete time signals and systems. Fast Fourier Transforms, recursive and non-recursive digital filter analysis and design, multirate signal processing, optimal linear filters, and power spectral estimation.

ECE 783/883. Digital Image Processing. Lecture 3 hours; 3 credits. Prerequisites: ECE 481/581 or 782/882. Principles and techniques of two-dimensional processing of images. Concepts of scale and spatial frequency. Image filtering in spatial and transform domains. Applications include image enhancement and restoration, image compressing, and image segmentation for computer vision.

ECE 787/887. Digital Communications. Lecture 3 hours; 3 credits. Prerequisite: ECE 451/551 or equivalent or permission of the instructor. Fundamental concepts of digital communication including: introduction to formal theoretic and signal space concepts; digital baseband modulation techniques including DAM, QAM, PSK and FSK; optimal detection of symbols and sequences; encoding and decoding of information for efficient transmission noise rejection. Spectrum controls and error control: design of digital communication systems.

ECE 795/895. Topics in Electrical and Computer Engineering. Lecture 3 hours; 3 credits. Prerequisite: departmental approval.

ECE 797/897. Independent Study. 3 credits. Prerequisite: permission of the department. This course allows students to develop specialized expertise by independent study (supervised by a faculty)

ECE 899. Ph.D. Dissertation Research. 1-9 credits. Prerequisite: departmental approval. Directed research for the doctoral dissertation.

ECE 999. Electrical and Computer Engineering. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Electrical Engineering Technology — See Engineering Technology

Engineering — ENGN

ENGN 454/554. Introduction to Bioelectrics. Lecture and design 3 hours; 3 credits. Prerequisites: PHYS 111N or higher; MATH 200 or higher. A one-semester course covering the electrical properties of cells and tissues as well as the use of electricity and magnetism in the diagnosis and treatment of disease. Typical topics to be covered include electrocardiography, cardiac pacing, defibrillation, electrotherapy, electroporation, electrotherapy in wound healing. In addition, ultrashort electrical pulses for intracellular manipulation and the application of plasmas to biological systems will be covered. (Cross-listed with ECE 454/554)

ENGN 601T. Engineering for Elementary/Middle School Teachers. Lecture 3 hours; 3 credits. Prerequisite: Bachelor's degree or permission of the instructor. An introduction to civil, environmental, electrical, mechanical, and computer engineering. The course will consist of elementary and middle school appropriate engineering content and concepts that directly correlate with the state and local school systems' science and mathematics curriculum.

ENGN 602T. Engineering for Secondary School Teachers. Lecture 3 hours; 3 credits. Prerequisite: Bachelor's degree or permission of the instructor. An introduction to foundations of design and civil, environmental, electrical, mechanical, and computer engineering. The

course will consist of secondary school appropriate content and concepts that directly correlate with the state and local school systems' science and mathematics curriculum. May lead to a Project Lead the Way certification when applicable.

ENGN 603T. Engineering Seminar for Teachers. Lecture 1 hour; 1 credit. Prerequisite: Bachelor's degree or permission of the instructor. An introductory seminar on specific multi-disciplinary or interdisciplinary engineering topics for MS or HS teachers.

ENGN 611. Financial Engineering. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Financial engineering management, accounting, financial reports and analysis, capital budgeting, investment decisions.

ENGN 612. Engineering Corporate Management. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Strategic management functions, employee benefits, managerial economics, labor relations, marketing, corporate ethics.

ENGN 622. Remote Sensing. Lecture 3 hours; 3 credits. The course will cover electromagnetic passive and active sensing systems, earth resource satellite systems, digital image formats, image enhancement, interpretations and applications of computer assisted interpretation in mapping, geology, water quality and urban and regional planning. It also covers image rectification, registration and image data merger with GIS.

ENGN 630. Advanced Bioelectrics. Lecture 3 hours; 3 credits. Prerequisite: bachelor's degree in physics, engineering or biology. A one-semester course covering advanced topics in bioelectrics. The course will cover advanced application of pulsed power and plasma in the medical, biological and environmental fields. (Cross-listed with ECE 630)

ENGN 695. Multidisciplinary Topics in Engineering. 1-3 credits. Special interdisciplinary or multidisciplinary topics of interest with emphasis on emerging areas in engineering.

ENGN 811. Methodologies for Advanced Engineering Projects. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Critical evaluation of published literature; experimental design and analysis; optimization methods; pre-project planning; definition of scope, projects risks, technical, economical, social, and political constraints; execution strategies; effective proposal development.

ENGN 812. Engineering Leadership. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Effective communication techniques, strategic planning, building collaborative relationships, conflict management, building high-performance teams, risk management, managing innovations.

ENGN 813. Engineering Ethics. Lecture 3 hours; 3 credits. Prerequisites: graduate standing. Scope of engineering ethics, moral reasoning and ethical theories, the engineer's responsibility for safety, responsibilities to the employer, responsibilities to the public, rights of engineers, global issues, professional codes of ethics, case studies.

Engineering Management — ENMA

ENMA 415/515. Introduction to Systems Engineering. Lecture 3 hours; 3 credits. Prerequisite: junior standing. Introduces the principles, concepts and process of systems engineering. Examination of problem formulation, analysis, and interpretation as they apply to the study of complex systems. Emphasizes the design

nature of systems engineering problem solving, and includes case studies stressing realistic problems. Development of system requirements, system objectives, and the evaluation of system alternatives.

ENMA 420/520. Statistical Concepts in Engineering Management. Lecture 3 hours; 3 credits. Prerequisite: MATH 211 or equivalent. Introduction to concepts and tools in probability and statistics with applications to engineering design, systems analysis, manufacturing, and quality management problems.

ENMA 422/522. Global Engineering and Project Management. Lecture 3 hours; 3 credits. Prerequisite: junior standing. Foundation, principles, methods and tools for effective design and management of projects in global transnational technology-based organizations. Project organization, life cycle, planning, scheduling implementation, control and evaluation. Use of case studies and oral and written reports to reinforce course concepts.

ENMA 600. Cost Estimating and Financial Analysis. Lecture 3 hours; 3 credits. Introduction to the monetary aspects of engineering projects, including accounting principles; financial reports and analysis; capital budgeting; cost estimation and control; inventory management; depreciation; investment decisions. Knowledge of probability and statistics (ENMA 420/520 or equivalent) is assumed. Case studies and a term project are required.

ENMA 601. Analysis of Organizational Systems. Lecture 3 hours; 3 credits. This course introduces the student to fundamental concepts in the analysis of organizations. A systems approach is taken in the examination of social, structural, procedural and environmental aspects that are of consequence to technical professionals and managers. Modules covered include: History and Systems of Organizations and Management; Basic Organizational Systems and Models emphasizing rational, natural and open systems; Organizational Behavior Models; Organizational Structure Models; Integration of Systems Perspectives.

ENMA 602. Systems Engineering Management. Lecture 3 hours; 3 credits. Students develop a comprehensive set of techniques and methods to design, maintain and evolve the systems engineering function in support of strategic enterprise objectives and operations.

ENMA 603. Operations Research. Lecture 3 hours; 3 credits. Deterministic and stochastic models for decision making. Topics include: optimization methods; linear and other programming models; network analysis; inventory analysis; queuing theory. Knowledge of probability and statistics (ENMA 420/520 or equivalent) is assumed.

ENMA 604. Project Management. Lecture 3 hours; 3 credits. Exploration of the systems approach to planning, scheduling, control, design, evaluation, and leadership of projects in technology-based organizations. The fundamental tools and techniques of project management; role of the project manager; project management systems; project selection; project life cycle; project monitoring and control; project management evaluation and auditing; project risk and failure analysis; contextual nature of project management; project knowledge.

ENMA 605. Program Capstone. Lecture 1 hour; 1 credit. Prerequisite: completion of minimum of 18 credit hours in program of study. Comprehensive demonstration of the ME or MEM candidate's competence in the fields covered by

the program of study. Written submission is required, intended to fulfill the non-thesis Master's Examination requirement.

ENMA 606. Engineering Law. Lecture 3 hours; 3 credits. Basic legal concepts and procedures for understanding the implications of engineering management decisions. Major emphasis on contracts and liability.

ENMA 607. Stochastic Decision Methods. Lecture 3 hours; 3 credits. Introduction to decision analysis and stochastic models; risk and uncertainty in decision making; probabilistic inventory problems; queuing theory; Markov processes; dynamic programming; Monte Carlo simulation of dynamic systems. Knowledge of probability and statistics (ENMA 420/520 or equivalent) is assumed.

ENMA 613. Logistics and Supply Chain Management. Lecture 3 hours; 3 credits. Prerequisite: ENMA 603. Studying how logistical decisions impact the performance of the firm and the entire supply chain. Topics include strategic planning, facilities location and analysis, distribution and transportation networks, forecasting, inventory management, and information systems for supply chains. Knowledge of probability and statistics (ENMA 420/520 or equivalent) is assumed. The course includes case studies and/or a project.

ENMA 614. Quality Systems Design. Lecture 3 hours; 3 credits. Integrated analysis of the process quality assurance and improvement function. Quality Deming's way. Scientific sampling and control charting for quality assurance and control; the quality cost concept and economic aspects of quality decisions. Organization of the quality function for process quality improvement. Knowledge of probability and statistics (ENMA 420/520 or equivalent) is assumed.

ENMA 616. The Entrepreneurial Engineering Manager. Lecture 3 hours; 3 credits. Globalization has increased competition among the planet's enterprises. The quality of products and services has dramatically improved while prices have plummeted. Consumer expectations have risen to very high levels. This phenomenon has accelerated the need for large technical enterprises to become more agile, flexible and responsive to consumer demands. Government agencies are not exempt from this trend: U.S. Government agencies are now required to establish strategic plans for their enterprises and to develop business plans that illustrate the future directions of the enterprise and to define the resources required to realize the vision and strategy of the enterprise. This course introduces Engineering Management students to a wide range of approaches designed to facilitate start-up, enable growth and ensure the continued capability of emerging and mature technical enterprises.

ENMA 640. Integrated Systems Engineering I. Lecture 3 hours; 3 credits. This course examines the role and nature of systems engineering. It is specifically designed to provide the fundamental understanding of systems engineering and complex systems. This course examines a variety of systems engineering topics with emphasis on the: (1) development of the fundamentals of systems engineering, (2) systems engineering life-cycle models and phases, (3) systems design for operational feasibility, and (4) an introduction to planning for systems engineering and management. This course prepares students to assume the role of a systems engineer in planning, directing, conducting, and assessing systems engineering initiatives.

ENMA 641. Requirements Management, Verification and Validation. Lecture 3 hours; 3 credits. Comprehensive treatment of the nature and utility of requirements, verification, and validation in systems engineering processes. Topics include: establishing user requirements; traceability; baseline and evolving requirements; governing standards; requirements management; issues in requirements for complex systems; role and methods for verification and validation in systems engineering; data treatment and analysis; standards, practices, and issues for verification and validation in systems engineering.

ENMA 660. Systems Architecture and Modeling. Lecture 3 hours; 3 credits. Students learn the essential aspects of the systems architecture paradigm through development and analysis of multiple architecture frameworks and enterprise engineering. Emphasis is placed on systems modeling and enterprise engineering.

ENMA 667. Cooperative Education. 1-3 credits. Available for pass/fail grading only. Student participation for credit based on academic relevance of the work experience, criteria, and evaluative procedures as formally determined by the department and the Cooperative Education program prior to the semester in which the work experience is to take place.

ENMA 668. Internship. 1-3 credits. Academic requirements will be established by the graduate program director and will vary with the amount of credit desired. Allows students an opportunity to gain short-duration career-related experience. Meant to be used for one-time experience. Work may or may not be paid. Project is completed during the term.

ENMA 669. Practicum. 1-3 credits. Prerequisite: approval by department and Career Management. Academic requirements will be established by the department and will vary with the amount of credit desired. Allows students an opportunity to gain short duration career related experience. Student is usually already employed - this is an additional project in the organization.

ENMA 688. Preparation Seminar for Systems Engineering Certification. 1 credit. A comprehensive treatment and review of systems engineering in preparation for the International Council for Systems Engineering (INCOSE) systems engineering certification. Students may elect this course to fulfill their program capstone requirement. Registration for the systems engineering certification examination is required for successful completion of this course (certification exam registration fee is not covered as part of this course).

ENMA 695/696. Topics in Engineering Management. Lecture 1-3 hours; 1-3 credits. Prerequisite: permission of the instructor. Special topics of interest with emphasis placed on recent developments in engineering management.

ENMA 697. Independent Study in Engineering Management. 3 credits. Prerequisite: permission of graduate program director. Individual study selected by the student. Supervised and approved by a faculty member with the approval of the graduate program director.

ENMA 699. Thesis. 1-6 credits. Prerequisite: ENMA 721 and permission of the graduate program director. Research leading to a Master of Science thesis.

ENMA 700/800. Economic Analysis of Capital Projects. Lecture 3 hours; 3 credits. Prerequisite: ENMA 600 or equivalent. This course is an advanced treatment of economic analysis. It is targeted at engineering managers

who actively participate in the capital budgeting process and project justification. Topics include capital budgeting techniques (including multi-attribute decision making), utility theory, justification of new technologies, and current research in engineering economics. Reading and application of current research in the field is stressed. Case studies are used. Oral presentations and term project required.

ENMA 702/802. Methods for Rational Decision Making. Lecture 3 hours; 3 credits. Prerequisite: ENMA 420/520 or equivalent. The goal of this course is to enhance the student's ability to make *rational* and *strategic* decisions in complex situations. The course is split in two modules: decision theory and game theory. The decision theory module focuses on how individuals make complex decisions, both from a prescriptive (ideal) and descriptive (actual) perspective. The game theory module focuses on strategic decision-making in situations where individuals must interact with one another.

ENMA 703/803. Optimization Methods. Lecture 3 hours; 3 credits. Prerequisite: ENMA 603 or equivalent. Covers advanced methods in Operations Research and Optimization. Focus will be on developing models and their applications in different domains including manufacturing and service. Modern optimization tools will be used to implement models for case studies, projects and research papers. The knowledge of programming and spreadsheets is expected. Contact instructor for more details.

ENMA 704/804. Design of Project Knowledge Systems. Lecture 3 hours; 3 credits. Prerequisite: ENMA 604 or equivalent. Graduate level research colloquium examining the application of a systems perspective to design, operation, analysis, and evaluation of project knowledge systems. Special emphasis will be placed on knowledge generation and generalization systems. Case studies, problems, and a course project.

ENMA 705/805. Financial Engineering. Lecture 3 hours; 3 credits. This course covers concepts in complex investments, how to deal with uncertainty in today's global markets, and how to engineer and manage financial decisions. The main topics include: cash flows, portfolio theory, capital management, securities, hedge funds, optimal investment and financial engineering evaluations among others. Cross-listed ENGN 611.

ENMA 710/810. Modeling and Analysis of Systems. Lecture 3 hours; 3 credits. Prerequisite: ENMA 603, Operations Research (or an equivalent course) and ENMA 420/520, Probability and Statistics (or an equivalent course). Covers modern modeling paradigms for deterministic and stochastic complex and dynamic systems. This includes, but not limited to, Discrete Simulation, Queuing Systems, and Agent-based models among others. Great focus will be on system analysis using different developed models in different domains such as production, logistics, security, and service, military and social. The course entails up to two exams, multiple case studies, individual and group projects and research papers.

ENMA 711/811. Methodologies for Advanced Engineering Projects. Lecture 3 hours; 3 credits. Prerequisite: ENMA 604 or equivalent. The course covers general topics that are necessary for project execution. This includes problem scoping, data collection, hypothesis formulation and testing, experimentation, testing and evaluation, qualitative analysis, quantitative analysis, and validation methods.

ENMA 712/812. Multi-Criteria Decision Analysis and Decision Support Systems. Lecture 3 hours; 3 credits. Currently, complex engineering-economic-societal decisions are made by involving numerous sometimes conflicting criteria and attributes, different decision rules and in the presence of various stakeholders with individual preferences who are willing to go into negotiation procedures. A number of multi-criteria decisions tools involving quantitative as well as qualitative methods, together with adequate decision support tools will be introduced. Case studies on a variety of engineering, environmental and security related aspects will also be considered.

ENMA 713/813. Integrating Ethics and Engineering Management. Lecture 3 hours; 3 credits. This graduate course is designed to expose prospective engineering managers to the theories and practices that are inherent in the ethical environment of modern organizations. Topics include definitions of ethical behavior and leadership, moral decision-making, the importance of values such as honesty, integrity, and trustworthiness. A full exploration of ethical autonomy, collaboration, communication and moral imagination will be conducted. A variety of methods will be used to facilitate learning, including a textbook, regular journaling, movies and videos, case studies, small work group activities, experiential activities and writing assignments. The successful student should gain a full understanding of the requirements for and the practice of ethical leadership and should be able to determine how to create and maintain a work environment that fosters openness and clear communication about issues and problems.

ENMA 714/814. Crisis Project Management. Lecture 3 hours; 3 credits. Graduate-level research colloquium examining the existing and potential role of project management approaches and analysis procedures in the handling of crisis-related activities. Emphasis will be placed on the management of organizational level processes and activities related to crisis preparation, handling and recovery. Case studies, problems and reports.

ENMA 715/815. Systems Analysis. Lecture 3 hours; 3 credits. Prerequisite: ENMA 420/520. The course is designed to provide an understanding of the interdisciplinary aspects of systems development, operation, and support. The course focuses on the application of scientific and engineering efforts to transform an operational need into a defined system configuration through the interactive process of design, test, and evaluation.

ENMA 716/816. Complex Adaptive Situations Environment. Lecture 3 hours; 3 credits. The course focuses on the manner in which information, knowledge, and awareness are processed to facilitate decision making, management and engineering in complex adaptive situations. Topics include: knowledge acquisition, formation of technical and contextual awareness, and the role of understanding.

ENMA 717/817. Cost Engineering. Lecture 3 hours; 3 credits. Introduction to parametric cost modeling techniques and methodologies; generation and application of statistical relationships between life cycle costs and measurable attributes of complex systems; sources of supporting data; quality function deployment; technology forecasting. Special emphasis on life cycle design for cost; cost risk analysis; and design optimization on cost bases. Case studies and a semester project.

ENMA 721/821. Research Methods in Engineering Management. Lecture 3 hours; 3 credits. This course is intended to prepare students to undertake substantiated, rigorous, scholarly research, particularly theses or dissertations. The course will focus on the approaches necessary to integrate research intent, methodologies, techniques and constraints. A variety of research methodologies will be investigated. Emphasis on problem formulation, literature review, proposal preparation, oral presentation, data analysis, experimentation and accepted canons of research. Knowledge of probability and statistics (ENMA 420/520 or equivalent) is assumed. Research paper required.

ENMA 723/823. Enterprise and Complex System Dynamics. Lecture 3 hours; 3 credits. The use of system dynamics modeling and simulation in various enterprise and complex system application areas. Topics include: complex and hierarchical system dynamics, tools for systems thinking, the dynamics of growth, modeling and simulation tools, and model development, use and analysis.

ENMA 724/824. Risk Analysis. Lecture 3 hours; 3 credits. Approaches to the management of risk; probability assessment methods; risk modeling; use of software packages; extensions of decision analysis, including stochastic dominance and multiattribute methods; applications to project management, scheduling, and cost estimation.

ENMA 735/835. Team Performance and Decision Making in Engineering. Lecture 3 hours; 3 credits. This course explores and models the use of teams in organizations with a specific focus on the role of teams in decision making and problem solving. Key areas include team building, assessment of team outcomes, team learning, virtual teams and team decision making. Actual work on teams is required including team deliverables.

ENMA 743/843. Reliability and Maintainability. Lecture 3 hours; 3 credits. Introduction to the theory and practice of reliability engineering, maintainability and availability. Reliability evaluation models and techniques; failure data collection and analysis; reliability testing and modeling; maintained systems; mechanical system reliability. Semester project. Knowledge of probability and statistics (ENMA 420/520 or equivalent) is assumed.

ENMA 750/850. System of Systems Engineering. Lecture 3 hours; 3 credits. Prerequisite: ENMA 641. Comprehensive treatment of System of Systems Engineering (SoSE), including: fundamental systems principles, concepts, and governing laws; complex and simple systems; underlying paradigms, methodologies and essential methods for SoSE analysis, design, and transformation; complex system transformation; current state of SoSE research and application challenges. Explores the range of technological, human/social, organizational/managerial, policy, and political dimensions of the SoSE problem domain.

ENMA 751/851. Complexity, Engineering and Management. Lecture 3 hours; 3 credits. Prerequisite: ENMA 641. This course examines management and engineering of complex systems as it is undertaken in complex situations. The student will develop an understanding of the unconditional attributes of complex systems and situations that become foundational in the development of robust methods to deal with the practical reality of working in dynamic, uncertain environments. Topics will include Complexity,

Complex Systems, Complex Adaptive Systems, Complex Responsive Processes, Complex Adaptive Situations Methodology, SOSE, Reciprocity, and Sociotechnical Systems.

ENMA 763/863. Robust Engineering Design. Lecture 3 hours; 3 credits. Robust design approach based on "Taguchi Methods." Off-line quality engineering and applied design-of-experiments methods; full factorial and fractional factorial designs; response surface methods. The course is designed to enable engineers and engineering managers from all disciplines to recognize potential applications, formulate problems, plan experiments, and analyze data. Knowledge of probability and statistics (ENMA 420/520 or equivalent) is assumed. Case studies. Semester project.

ENMA 771/871. Risk and Vulnerability Management of Complex Interdependent Systems. Seminar discussions and team projects; 3 credits. Prerequisite: permission of the instructor. A systematic approach to basic principles of design, economics and management of critical infrastructure systems, including issues of risk, vulnerability and risk governance. Development of advanced methodologies, e.g. system of systems, by use of complexity analysis, dynamic/chaotic behavior, threat analysis, resilient design and management under normal and stress conditions. Adopting an agent based modeling approach under conditions of uncertainty, dysfunctionality, malicious attacks and/or presence of natural perils.

ENMA 780/880. Leadership for Engineering Managers. Seminar discussions and team projects; 3 credits. Prerequisite: ENMA 601 or Ph.D. Standing. This course is designed to expose students to the concepts, skills, characteristics and emotional composition of effective and successful leaders in the 21st century. The course is intensive and requires students to immerse themselves in the course material and classroom discussion to derive meaning and value from the topics. The course objectives will be achieved by classroom discussion of the assigned material, candid self-assessment, experimental exercises and analysis of the actions of leaders, as described in case studies and literature. Areas of exploration include the fundamentals of leadership, ethical leadership, social capital, emotional intelligence and three-dimensional leadership.

ENMA 795/895, 796/896. Topics in Engineering Management. Lecture 3 hours; 3 credits. Special topics of interest with emphasis placed on recent developments in engineering management.

ENMA 797/897. Independent Study in Engineering Management. 1-3 credits. Prerequisite: permission of the instructor and graduate program director. Designed for advanced individualized study into an engineering management topic area. Independent study projects will be related to engineering management and completed under the supervision of a certified faculty member.

ENMA 888. Ph.D. Seminar. 2 hours per week; 1 credit. Discussion of research projects, topics, and problems of Engineering Management faculty, researchers, and students. A weekly exchange of ideas and issues between faculty and Ph.D. students focused on doctoral research.

ENMA 892. Doctor of Engineering Project. 1-12 credits. Directed individual study applying advanced-level technical knowledge to identify, formulate, and solve a complex, novel problem in Engineering Management.

ENMA 898. Research in Engineering Management. 1-12 credits. Prerequisites: ENMA 821 and permission of graduate program director. Supervised research prior to passing Ph.D. candidacy exam.

ENMA 899. Dissertation Research. 1-9 credits. Prerequisites: ENMA 821 and permission of instructor.

ENMA 999. Engineering Management 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Mechanical Engineering — ME

ME 404/504. Vibrations. Lecture 3 hours; 3 credits. Prerequisites: ME 205, 220, and 340 and MATH 312. Free and forced vibrations of undamped and damped, single-degree of freedom, multi-degree of freedom, and continuous systems. Exact and approximate methods to find natural frequencies.

ME 407/507. Motorsports Vehicle Dynamics. Lecture 2 hours; laboratory 3 hours; 3 credits. Prerequisites: ME 205 and MATH 307. Basic mechanics governing vehicle dynamic performance. Analytical methods in vehicle dynamics. Laboratory consists of various vehicle dynamics tests on model vehicles. This course cannot replace any of the approved ME option courses. (cross-listed with AE 457/557)

ME 411/511. Mechanical Engineering Power Systems Theory and Design. Lecture 3 hours; 3 credits. Prerequisites: ME 312 and 315. Thermodynamic properties of gases and vapors relating to power generating devices, work-energy relations, combustion, and heat exchangers. Performance analyses and design concepts of gas turbines, internal combustion engines, steam power plants and heat exchanger equipment from theoretical and applied viewpoints.

ME 412/512. Environmental Control. Lecture 3 hours; 3 credits. Prerequisites: ME 312 and 315. Engineering principles as applied to the analysis and design of systems for automatically controlling man or machine environments. Course encompasses fundamentals of heating, ventilating, air conditioning, refrigeration, cryogenics, and design of building energy systems.

ME 413/513. Energy Conversion. Lecture 3 hours; 3 credits. Prerequisite: ME 312. Introduction of relevant kinetic theory, solid state, and thermodynamic principles; operation and analysis of thermoelectric, photovoltaic, thermionic, magnetohydrodynamic devices, fuel cell, isotopic, and solar power generators. Course seeks to define engineering limits of converter efficiency and other performance criteria.

ME 414/514. Introduction to Gas Dynamics. Lecture 3 hours; 3 credits. Prerequisites: ME 303 and 311. One-dimensional compressible flow considering isentropic flow, normal shocks, flow in constant area ducts with friction, flow in ducts with heating and cooling, oblique shocks, Prandtl-Meyer expansions, shock-expansion theory, flow around diamond shaped airfoils, and wind tunnel mechanics.

ME 422/522. Modern Engineering Materials. Lecture 3 hours; 3 credits. Prerequisites: ME 201, 203, 220, and 332. Limitations of conventional materials; inter-relationship among materials, design and processing, material selection criteria and procedures; strengthening mechanisms in

metals; superelasticity; shape memory effect, amorphous metals; structure-property relationship in polymers; polymers crystallinity; thermoplastic and thermosets; high-temperature restraint polymers; ceramics; toughening mechanisms in ceramics.

ME 431/531. Mechanisms Analysis and Design. Lecture 3 hours; 3 credits. Prerequisites: ME 205 and 332 and MATH 312. Basic relations necessary for analysis of plane motion mechanisms, numerical and analytical solutions for some of the basic mechanisms, methods of calculating rolling and sliding velocities and accelerations of contacting bodies, cams, and gears.

ME 438/538. Control System Design and Applications. Lecture 3 hours; 3 credits. Prerequisite: ME 436. Analysis, computer-aided design and implementation of practical control systems; introduction to state-space and digital control; laboratory sessions on data acquisition, system identification, analog-computing, and implementation of analog and digital controllers.

ME 440/540. Introduction to Finite Element Analysis. Lecture 3 hours; 3 credits. Prerequisites: ME 315, 332, and 340. Basic concepts of finite-element method, method of weighted residuals, interpolation functions, numerical implementation of finite-element method, applications to engineering problems such as beam deflection, heat conduction, and plane elastic problems.

ME 495/595, 496. Topics in Mechanical Engineering. Lectures variable; 1-3 credits each semester. Prerequisite: senior standing; permission of the chair is required. Special topics of interest with emphasis placed on recent developments in mechanical engineering or engineering mechanics. (offered fall, spring, summer)

ME 605. Advanced Dynamics. Lecture 3 hours; 3 credits. Prerequisites: ME 205 and MATH 312. Derivatives of vector functions and rotation frames of reference, dynamics of particles, Lagrange equations and rigid body dynamics. Application to mechanical systems is emphasized with computer applications.

ME 606. Energy and Variational Methods in Structural Mechanics. Lecture 3 hours; 3 credits. Corequisite: MATH 691. Concepts of energy and variational methods, calculus of variations, variational principles of structural mechanics, Castigliano's Theorems. Approximate methods of solution, applications to bars, beams, and plates. Linear stress, buckling and vibration problems. (Cross-listed with AE 603.)

ME 607. Introduction to Continuum Mechanics. Lecture 3 hours; 3 credits. Corequisite: MATH 691. Indicinal notations and tensor calculus; stress and strain tensors; rate of deformation tensor, Eulerian and Lagrangian descriptions, conservation principles, constitutive formulations from elastic solids and viscous fluids, formulations of fluid mechanics and solid mechanics problems. Simple applications. (Cross-listed with AE 601.)

ME 608. Computational Methods in Mechanical Engineering. Lecture 3 hours; 3 credits. Prerequisite: MATH 316 or ME 340. Numerical methods for linear algebra eigenvalue problems, curve fitting optimization, differentiation, integration, ordinary and partial differential equations. Applications in mechanical engineering.

ME 609. Theory of Elasticity. Lecture 3 hours; 3 credits. Prerequisites: MATH 691 and AE 601, or ME 607. Equations of equilibrium,

strain-displacement, compatibility, and constitutive equations using Airy and complex potential stress functions; plane engineering boundary value problems for beams, disks, thick-walled cylinders and various stress raiser problems. Torsion of thin-walled sections. General three-dimensional elasticity problems. (Cross-listed with AE 630.)

ME 610. Advanced Fluid Dynamics. Lecture 3 hours; 3 credits. Prerequisite: MATH 691. Conservation laws of mass, momentum and energy equations; boundary conditions; exact and approximate solutions of Navier-Stokes equations; boundary-layer theory; introduction to internal and rotational flows; application to flows in pipes and blade passages; introduction to turbulent flows. (cross-listed with AE 602)

ME 611. Advanced Classical Thermodynamics. Lecture 3 hours; 3 credits. Corequisite: MATH 691. Rigorous development of the macroscopic theory of thermodynamics; structural basis for equations of state and general properties of matter; phase and chemical equilibria.

ME 614. Theory and Design of Turbomachines. Lecture 3 hours; 3 credits. Prerequisites: ME 414 and 610. Real cycles; fluid motion in turbomachines; theory of diffusers and nozzles; fluid-rotor energy transfer; radial equilibrium; transonic stages; combustion chambers; axial and centrifugal turbines; axial and centrifugal pumps and compressors; performance and design criteria; cavitation and two-phase flow considerations.

ME 615. Compressible Flow. Lecture 3 hours; 3 credits. Prerequisites: ME 414/514 and 610. Conservation equations in compressible flows; full potential equations; small perturbation equations; two-dimensional compressible flow; hodographs, method of characteristics; introduction to three-dimensional flows; compressible boundary layer flows; internal flows in nozzles and diffusers; generalized quasi-1 D internal flows.

ME 618. Convection Heat Transfer. Lecture 3 hours; 3 credits. Prerequisite: ME 610. Corequisite: ME 611. Conservation equations; heat transfer in internal and external flow fields; problems in laminar and turbulent boundary layers for incompressible and compressible flow; energy transfer in free convection, multiphase flows.

ME 619. Conduction Heat Transfer. Lecture 3 hours; 3 credits. Prerequisite: MATH 691. Corequisite: MATH 692. Analytic and numerical solutions to steady and unsteady, one-, two-, and three-dimensional problems, extended surfaces, boundary value and characteristic value problems.

ME 620. Introduction to the Theory of Plasticity. Lecture 3 hours; 3 credits. Prerequisite: ME 609 and permission of the instructor. Stress and strain tensors, equations of elasticity; basic plasticity experiments; criteria for yielding, initial and subsequent yield surfaces, plastic stress-strain relations, incremental and boundary value problems.

ME 621. Advanced Materials Science. Lecture 3 hours; 3 credits. Corequisite: MATH 691. Thermodynamics of phase equilibria, statistical theory of solid solutions, and kinetic phenomena such as diffusion and nucleation applied to phase stability and transformations in solids.

ME 622. Mechanical Behavior of Materials. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Macroscopic behavior of materials with respect to elasticity, plasticity, and viscoelasticity; yield criteria, fracture, influence of high and low temperatures, corrosion and radiation.

ME 623. Theory of Vibrations. Lecture 3 hours; 3 credits. Prerequisites: ME 404/504 and MATH 691. Introduction to applied modal analysis, modes of vibration of discrete systems; modal coordinates, transfer functions in frequency domain, modes of vibration of continuous systems and approximate systems response. Practical and computer applications are incorporated. (cross-listed with AE 634)

ME 632. Nuclear Engineering. Lecture 3 hours; 3 credits. Nuclear power plant systems; power reactor control and kinetic behavior, including safety coefficients, accumulative poisons, temperature control parameters; primary and secondary plant as a transient system.

ME 635. Finite Element Analysis I. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. To provide an understanding of the finite element method (FEM) as derived from an integral formulation perspective. To demonstrate the solutions of (1-D and 2-D) continuum mechanics problems such as solid mechanics, fluid mechanics and heat transfer. To provide insight into the theoretical formulation and numerical implementation of finite element methods. (Cross-listed with AE 640 and CEE 711/811)

ME 636. Modern Control Theory. Lecture 3 hours; 3 credits. Prerequisite: ME 436 or equivalent. Formulation of state space equations governing dynamics and stability of linear systems. Controllability; observability. State feedback control design. Optimal control methods. State observers and estimators. (Cross-listed with AE 650.)

ME 640. Energy Utilization and Conservation. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Overview of scope of efficient energy utilization in industrial, commercial, transportation, and power-generation fields; power plant waste-heat utilization, district heating, combined gas and steam cycle, organic fluid-bottoming cycle, total energy concept for residential and commercial buildings; system management, on-line computer evaluation, energy analysis.

ME 644. Turbulent Flow I. Lecture 3 hours; 3 credits. Prerequisite: ME 610. Basic turbulent flow concepts; origin of turbulence, introduction to turbulence measurements; introduction to turbulence modeling; eddy viscosity/diffusivity concept; zero-equation models, one-equation models, two-equation models; introduction to second-moment closures; applications to boundary layers, shear layers, jets, plumes, wakes, and separated flows. (Cross-listed with AE 713/813)

ME 646. Corrosion of Materials. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. This course covers the basics of corrosion theory and electrochemical foundation of corrosion processes. It will cover the chemical and metallurgical processes occurring during corrosion, along with the application of materials and methods to prevent corrosion. Stress corrosion cracking, corrosion fatigue, and other types of corrosion related failure will be discussed, along with design of systems to minimize the effects of corrosion and make use of corrosion resistant materials in their production and development. Corrosion of metals will be emphasized, but non-metals (polymers, composites, and ceramics) will be discussed.

ME 650. Composite Materials. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Reinforcements, matrices, particulate composites; short-fiber and continuous-fiber reinforced composites; prediction of elastic failure

properties; directionally solidified composites; design considerations; experiments.

ME 651. Experimental Stress Analysis. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Brittle coatings; electrical resistance and semi-conductor strain gages, special purpose strain gages; stress gages, shear gages, etc; strain gage circuits, strain gage-based transducers; photoelasticity theory and two-dimensional techniques; compensation and principle stress separation methods.

ME 654. Thermomechanical Processing of Materials. Lecture 3 hours; 3 credits. Prerequisites: ME 201, 203, and 225. Principles of thermal and chemical refining processes; modeling melting and solidification processes; fundamentals of metal castings including flow of molten metal and heat transfer during solidification; superplastic forming of metals, strain crystallizing of polymers; effects of processing on properties.

ME 655. Advanced Design. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Concepts, principles and procedures related to analysis of stresses and strains in machine components. Consideration of function of parts along with factors such as forces, life required, maximum cost, weight and space restrictions, number of parts to be produced, material selection, kinematics, environmental restrictions. Finite element analysis to illustrate different aspects of stress analysis.

ME 667. Cooperative Education. 1-3 credits. Available for pass/fail grading only. Student participation for credit based on academic relevance of the work experience, criteria, and evaluative procedures as formally determined by the department and the Cooperative Education program prior to the semester in which the work experience is to take place.

ME 668. Internship. 1-3 credits. Prerequisite: approval by the department and Career Management Center. Academic requirements will be established by the department and will vary with the amount of credit desired. Allows students an opportunity to gain short duration career-related experience.

ME 669. Practicum. 1-3 credits. Prerequisite: approval by department and Career Management Center. Academic requirements will be established by the department and will vary with the amount of credit desired. Allows students an opportunity to gain short duration career-related experience. Student is usually already employed - this is an additional project in the organization.

ME 670. Engineering Software for Computer-Aided Analysis and Design. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Introduction to advanced CAD software for finite element modeling and analysis, multi-body dynamic analysis, kinematic analysis and design optimization. MSC/NASTRAN, PATRAN, DADS, GENESIS and other commercially available software will be introduced.

ME 680. Applied Mathematics for Design and Manufacturing. Lecture 3 hours; 3 credits. Prerequisite: MATH 312. Linear algebra. Vectors and matrices. Partial differential equations. Curve fittings. Applied probabilities. Statistics of distributions. Testing of hypotheses and decisions. Quality control.

ME 682. Concurrent Engineering. Lecture 3 hours; 3 credits. Study of principles of concurrent engineering with emphasis on the design-manufacture interface for single products; Rapid prototyping projects; Design of injection-molded and stamped parts for cost.

ME 684. Process Modeling and Re-Engineering. Lecture 3 hours; 3 credits. Prerequisite: ME 682. Study of methodologies and available tools to analyze "problem" processes and determine solutions to improve bottom-line performance. A Process Modeling project will be the key component of this course to reinforce the principles of Process Re-Engineering. Another major topic is Parametric Design by Guided Iteration.

ME 685. Projects in Design and Manufacturing. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Project(s) course to allow graduate students to complete a practical engineering assignment in design and manufacturing areas. (available for pass/fail grading only)

ME 686. Engineering Design with Uncertainties. Lecture 3 hours; 3 credits. Prerequisite: ME 680 or permission of the instructor. An introduction to manage uncertainties and risk in strength design of mechanical components. A study of theoretical background, computational implementation, and applications of reliability-based methods for engineering analysis and design.

ME 690. Mechanical Engineering Seminar. 1 credit. Current topics in Mechanical Engineering or Engineering Mechanics are reviewed, often by guest lecturers.

ME 692. Robots and Manufacturing Automation. Lecture 3 hours; 3 credits. Prerequisite: ME 436. Manufacturing processes. Automatic production and assembly. Numerical control. Industrial robots. Logic control systems. Logic diagramming. Programmable logic control. On-line computer control. Computer-integrated manufacturing. Case studies.

ME 695. Topics. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Special topics of interest with emphasis placed on recent developments in mechanical engineering or engineering mechanics.

ME 697. Independent Study. 1-3 credits. Prerequisite: permission of the instructor. Individual analytical and/or experimental study selected by the student. Supervised and approved by the advisor.

ME 698. Master's Project. 1-3 credits. Individual project, investigation under the direction of the student's major professor. (available for pass/fail grading only)

ME 699. Thesis. 1-6 credits. Prerequisite: permission of the instructor. Research leading to the Master of Science thesis.

ME 706/806. Modal Analysis and Identification. Lecture 3 hours; 3 credits. Prerequisites: ME 404/504 and 623. Theoretical basis of modal analysis; measurements and excitation techniques; frequency- and time-domain modal identification techniques with applications to different model structures; direct parameter identification; component mode synthesis.

ME 713/813. Theory of Transfer Phenomena. Lecture 3 hours; 3 credits. Prerequisites: ME 611 and 618. An introduction to various diffusion processes; conservation equations for multicomponent systems, multicomponent fluxes in terms of driving forces and phenomenological coefficients; molecular transfer phenomena in fluids, the Boltzmann equation and the collision integrals, moments of the Boltzmann equation, Chapman-Enskog expansions, and evaluation of the transport properties; diffusion in solids and in laminar and turbulent flows; special

topics on combined mass, momentum, and energy transfer.

ME 715/815. Engineering Optimization I. Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Formulation and solution algorithms for Linear Programming (LP) problems. Unconstrained and constrained nonlinear programming (NLP) problems. Optimum solution for practical engineering systems. (Cross-listed with CEE 715/815)

ME 717/817. Turbulent Flow II. Lecture 3 hours; 3 credits. Prerequisite: ME 644. Basic concepts in isotropic, homogeneous, free-shear, and wall turbulence; statistical theories of turbulence; one-point closure models, two-point closure models; coherent structures, direct numerical simulation, large eddy simulation, and sub-grid scale models.

ME 718/818. Engineering Optimization II. Lecture 3 hours; 3 credits. Prerequisite: ME 715/815 or CEE 715/815. Sensitivity analysis of discrete systems; sensitivity analysis of distributed systems; dual methods for constrained optimization; optimization decomposition, multilevel optimization and recent developments in engineering optimization. (Cross-listed with CEE 718/818.)

ME 734/834. Radiation Heat Transfer. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Thermal radiation and radiation properties; radiation interchange in nonparticipating media; radiant energy transfer through absorbing, emitting, and scattering media; radiation in presence of other modes of energy transfer; approximate and advanced methods for radiation transfer analyses.

ME 742/842. Fatigue and Fracture. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Divided into areas of fatigue and fracture; stress-controlled and strain-controlled fatigue; effect of mean stresses, notches, etc; multi-axial stresses; variable amplitude loading; ductile and brittle fracture; linear elastic fracture mechanics; crack-tip plasticity; fracture testing; applications to fatigue life estimation.

ME 744/844. Computer Integrated Manufacturing. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Study of the design, control, and management of integrated production/manufacturing systems. Topics include modeling of production systems; fundamentals of CAD/CAM, robotics, flexible manufacturing systems, group technology, process planning, concurrent engineering, and shop floor control; CIM architecture and communication.

ME 745/845. Contemporary Manufacturing Technology. Lecture 3 hours; 3 credits. Prerequisite: ME 744/844. Treatment of the next generation of manufacturing technology. Topics include manufacturing strategy; trends in manufacturing control; factory simulation; accounting for manufacturing; and issues in manufacturing systems design.

ME 746/846. Computational Methods in Multibody Dynamics. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. The objective of this course is to present basic methods for the computer formulation and solution of the equations of kinematics and dynamics of mechanical systems which are often made of interconnected bodies. The major topics include constrained motion, principle of virtual work, constrained dynamics and spatial dynamics.

ME 747/847. Life Cycle Engineering. Lecture 3 hours; 3 credits. Prerequisite: ME 682. Study of environmental impacts of engineering

products and processes throughout their life cycle. Emphasis on life cycle assessment, recycling, reusing, remanufacturing, and economic considerations.

ME 748/848. Kinematic Synthesis of Mechanisms. Lecture 3 hours; 3 credits. Classification of mechanisms; type and number synthesis, application of graph theory, expert systems for synthesis; introduction to dimensional synthesis via path and function generation; finite displacement theory including concept of poles, circlepoint, and centerpoint curves; structural error minimization using Chebyshev's approximation; optimization approaches, current applications to robot manipulators, robot hands, space structures, and combustion engines.

ME 750/850. Nanoscale Mechanical and Structural Properties of Materials. Lecture 3 hours; 3 credits. Elastic and plastic properties of nanoscale materials, strain gradient dislocation plasticity, nanoindentation and nanoindentation creep, thin film mechanical and structural properties, kinetic-based investigations of hardening mechanisms in nanolayers composites.

ME 757/857. Optimal Control Theory. Lecture 3 hours; 3 credits. Prerequisite: ME 636. Parameter optimization, optimization problem for dynamic systems with terminal and path constraints; optimal feedback control with and without the presence of uncertainty; nonlinear optimal control system.

ME 780/880. Fundamentals of Combustion. Lecture 3 hours; 3 credits. Prerequisites: ME 610 and 611. Chemical equilibrium in reacting systems, chemical kinetics of single and multi-step chemical reaction systems, conservation equations for multicomponent reacting systems; Shvab-Zeldovich formulation, detonation and deflagration waves, flammability limits; premixed laminar flames, gaseous diffusion flames; application to engine processes.

ME 790/890. Chemically Reacting Flows. Lecture 3 hours; 3 credits. Prerequisites: ME 414/514 and 610. Chemical kinetics in homogeneous and surface processes; integration of relaxation rates in the conservation principles of fluid mechanics; non-dimensional parameters and limit case applications.

ME 795/895. Topics in Mechanical Engineering or Engineering Mechanics. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Selected topics in mechanical engineering or engineering mechanics.

ME 796/896. Topics in Mechanical Engineering or Engineering Mechanics. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Selected topics in mechanical engineering or engineering mechanics.

ME 899. Ph.D. Dissertation Research in Mechanical Engineering or Engineering Mechanics. Variable credit. Prerequisite: permission of the instructor.

ME 999. Mechanical Engineering 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Mechanical Engineering Technology — See Engineering Technology

Modeling and Simulation — MSIM

MSIM 405/505. Introduction to Discrete Event Simulation. Lecture 3 hours; 3 credits. Prerequisites: undergraduate course in probability and statistics; computer literacy. An introduction to the fundamentals of discrete event simulation (DES). Topics include discrete event simulation methodology, development of simulation modes, simulation verification and validation, and the design of simulation experiments. Important statistical concepts, including selection of input probability distribution and output data analysis are developed and applied. A DES tool will be used to create, simulate and analyze self-defined projects. (cross listed with ECE 405/505)

MSIM 601. Introduction to Modeling and Simulation. Lecture 3 hours; 3 credits. This course, a required core course for those seeking a Master of Engineering or a Master of Science in modeling and simulation, provides an overview of the field of Modeling and Simulation (M&S). After a brief historical review, a range of M&S concepts are explored with special attention to those elements of the field that are widely practiced. Students are required to develop a substantive research paper on an approved topic in the field.

MSIM 602. Computer Science Concepts for Modeling and Simulation. Lecture 3 hours; 3 credits. Corequisite: MSIM 601. Introduction to computer science concepts essential for implementation of large simulations. Emphasis on design and analysis of algorithms and implementation and use of data structures. Intended for MSIM students without a CS degree. Not open for credit for CS graduates or majors.

MSIM 605. Engineering Systems Modeling. Lecture 3 hours; 3 credits. Prerequisites: MATH 307 and one course on probability or statistics. The goal of this course is to develop understanding of the various modeling paradigms appropriate for conducting digital computer simulation of many types of systems. The techniques and concepts discussed typically include concept graphs, Bayesian nets, Markov models, Petri nets, system dynamics, Bond graphs, cellular automata, Lsystems, and parallel and distributed simulation systems. Students will report on a particular technique and team to implement a chosen system model. (Cross listed with ECE 605)

MSIM 607. Machine Learning I. Lecture 3 hours; 3 credits. Prerequisite: Graduate standing. Course provides a practical treatment of design, analysis, implementation and applications of algorithms. Topics include multiple learning models: linear models, neural networks, support vector machines, instance-based learning, Bayesian learning, genetic algorithms, ensemble learning, reinforcement learning, unsupervised learning, etc. (cross listed with ECE 607)

MSIM 608. Introduction to Game Development. Lecture 3 hours; 3 credits. Prerequisite: CS 361 or equivalent. Introduction to Game Development is an introductory course focused on game development theory and practices using Microsoft XNA Game Studio with emphasis on educational game development. Topics covered in this course include game architecture, computer graphics theory, user interaction, audio, high level shading language, animation, physics and artificial intelligence.

MSIM 611. Modeling and Simulation Fundamentals I. Lecture 3 hours; 3 credits.

Prerequisites: MATH 102M or 162M or equivalent; CS 101D or equivalent; graduate standing. Introduction to the discipline of modeling and simulation for students not in engineering or sciences. Topics include: basic terminology and concepts; M&S paradigms including Monte Carlo, continuous, and discrete event simulation; and important concepts from supporting disciplines including probability and statistics, systems modeling, analysis and operations research, and computer visualization.

MSIM 612. Modeling and Simulation Fundamentals II. Lecture 3 hours; 3 credits. Prerequisites: MSIM 611. Topics include: concepts from supporting disciplines including human factors and project management; M&S methodologies including modeling approaches, verification and validation, distributed simulation, and interoperability and integration. Overview of M&S applications in engineering, science, education, health science, business, and arts & letters.

MSIM 635. Modeling in Musculoskeletal Biomechanics. 3 credits. Prerequisite: MATH 316 or equivalent. Investigation of joint biomechanics. Role of bone cartilage, ligaments, tendon and muscle in joint mechanics. Mathematical models for joint components. Computational models of joints and human motion and experimental techniques used to validate models.

MSIM 641. Visualization I. Lecture 3 hours; 3 credits. Course provides an overview of interactive, real-time 3D computer graphics and visual simulations using high level developing tools. Methods of visual simulation, computer graphics theory, advanced rendering techniques and various application areas are discussed.

MSIM 651. Analysis I. Lecture 3 hours; 3 credits. Introduction to topics from operations research and statistics that are necessary to conduct requirements-driven analysis. An objective is to develop an understanding of the role of modeling and simulation in operations research.

MSIM 660. System Architecture and Modeling. Lecture 3 hours; 3 credits. Students will learn the essential aspects of the system architecture paradigm through environment and analysis of multiple architecture framework and enterprise engineering, such as IDEFO, TOGAF, DODAF and OPM. Emphasis on system modeling and enterprise engineering. (Cross listed with ENMA 660)

MSIM 667. Cooperative Education. 1-3 credits. Available for pass/fail grading only. Student participation for credit based on academic relevance of the work experience, criteria, and evaluation procedures as formally determined by the program and the Cooperative Education/Career Management program prior to the semester in which the work experience is to take place.

MSIM 669. Practicum. 1-3 credits. Academic requirements will be established by the graduate program director and will vary with the amount of credit desired. Allows students an opportunity to gain short-duration career related experience. Student is usually employed—this is an additional project beyond the duties of the student's employment.

MSIM 695. Topics in Modeling and Simulation. Lecture 3 hours; 3 credits. Special topics of interest with emphasis placed on recent developments in modeling and simulation.

MSIM 697. Independent Study in Modeling and Simulation. 3 credits. Prerequisite: permission of instructor or graduate program director. Individual study selected by the student.

Supervised and approved by a faculty member with the approval of the graduate program director.

MSIM 699. Thesis. 1-6 credits. Prerequisite: permission of instructor and graduate program director. Research leading to the Master of Science thesis.

MSIM 702/802. Methods of Rational Decision Making. Lecture 3 hours; 3 credits. Covers advanced methods in Operation Research and Optimization. Focus will be on developing models and their application in different domains including manufacturing and services. (Cross listed with ENMA 702/802)

MSIM 720/820. Foundations for Continuous and Real-Time Simulation. Lecture 3 hours; 3 credits. Prerequisites: calculus-based physics and ordinary differential equations. Explores the modeling principles associated with simulating physical systems in real time. Develops models of mechanical, electrical, thermal, fluid, and hybrid systems and simulates the time-varying response of these systems. Various case studies employing these principles are presented and discussed. A course project and formal report are required.

MSIM 725/825. Principles of Combat Modeling and Simulation. Lecture 3 hours; 3 credits. Prerequisites: MSIM 601; MSIM 505. Principles of combat modeling and simulation. Introduction including history, basic definitions, and best practice. Algorithms for modeling movement, sensing effects and behavior. Overview of modern combat models. Interoperability and integration into operational environments.

MSIM 730/830. Simulation Formalisms. Lecture 3 hours; 3 credits. Prerequisite: MSIM 601 or equivalent. The focus of the course is on identification and investigation of mathematical and logical structures that form the foundation for computational simulation. Topics include: foundations of simulation theory in logic, discrete mathematics, and computability; simulation formalisms, including DEVS; interoperability protocols; and computational complexity.

MSIM 742/842. Visualization II. Lecture 3 hours; 3 credits. Prerequisite: MSIM 641 or permission of instructor. Course discusses a variety of topics in advanced visualization theory and applications. Topics included visualization, level of detail techniques, animation, terrain visualization, flow and ocean visualization, and cal imaging and visualization.

MSIM 752/852. Analysis II. Lecture 3 hours; 3 credits. Prerequisites: MSIM 505 and 605 or equivalent. This course will expand the student's capabilities in areas of stochastic analysis and data analysis. Course will include the theoretical underpinnings of stochastic processes commonly encountered in the application of operations research, and it will examine the literature of applied stochastic methods.

MSIM 775/875. Transportation Network Models and Optimization. Lecture 3 hours; 3 credits. This course is designed to show the broad applicability of network modeling techniques to the problems of designing and operating various transportation systems. Topics to be covered include fundamentals of graph theory, routing algorithm network flow problems, assignment and matching problems, facility location problems and relevant optimization techniques.

MSIM 776/876. Simulation Modeling in Transportation Networks. Lecture 3 hours; 3 credits. Principles of simulation modeling, microscopic, mesoscopic, and macroscopic traffic simulation models. Driver behavior in networks.

Calibration and validation of traffic simulation models. Traffic simulation software.

MSIM 781. Imaging Technologies for Homeland Security. Lecture 3 hours; 3 credits. Prerequisites: Calculus and Linear Algebra. This course introduces the fundamentals of various imaging technologies that are used in Homeland Security applications, including Visible, Infrared, Ultrasound, X-ray, and Terahertz. Models for the different technologies will be discussed vis-à-vis their application to homeland security. Visible imagery will be examined in detail for reconnaissance and surveillance. Joint use of data for image and information fusion or security applications will also be examined. (Cross listed with ECE 781)

MSIM 795/895. Topics in Modeling and Simulation. Lecture 3 hours; 3 credits. Special topics of interest with emphasis placed on recent developments in modeling and simulation.

MSIM 797/897. Independent Study in Modeling and Simulation. 3 credits. Prerequisite: permission of instructor or graduate program director. Individual study selected by the student. Supervised and approved by a faculty member with the approval of the graduate program director.

MSIM 892. Doctor of Engineering Project. 1-9 credits. Directed individual study applying advanced level technical knowledge to identify, formulate and solve a complex, novel problem in Modeling and Simulation.

MSIM 898. Research in Modeling and Simulation. 1-12 credits. Prerequisite: permission of instructor and graduate program director. Supervised research prior to passing Ph.D. candidacy exam.

MSIM 899. Dissertation. 1-12 credits. Prerequisite: permission of instructor and graduate program director. Directed research for the doctoral dissertation.

MSIM 999. Modeling and Simulation 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully achieving "candidate" status, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

College of Health Sciences

www.hs.odu.edu

E. Andrew Balas, Dean

Deborah B. Bauman, Assistant Dean

Doctorate	Health Services Research (Ph.D.) Physical Therapy (D.P.T.) Doctor of Nursing Practice (D.N.P)
Master's	Community Health (M.S.) Emphasis areas Environmental health Health care management Health education/promotion Long term care administration Dental Hygiene (M.S.) Nursing (M.S.N.) Public Health (M.P.H.)
Accelerated Programs	B.S. in Health Sciences to an M.S. in Community Health B.S. in Dental Hygiene to an M.S. in Dental Hygiene B.S. in Environmental Health to an M.S. in Community Health
Graduate Certificate Programs	Healthcare Management Occupational Safety

College of Health Sciences

2114 Health Sciences Building
Norfolk, VA 23529
757-683-4960

The college mission is to improve individual and community health by advanced professional education, influential research, and responsive service. The vision of the College of Health Sciences is to be an internationally recognized leader in advancing health care by educating competent practitioners, generating practically significant scientific knowledge and innovative technologies, fostering scholarly collaborations, and promoting positive public health policies.

The college consists of the School of Community and Environmental Health, the Gene W. Hirschfeld School of Dental Hygiene, the School of Medical Laboratory and Radiation Sciences, the School of Nursing, and the School of Physical Therapy. These schools offer a variety of master's and doctoral degrees, and non-degree certificate programs, accelerated and degree completion programs, and professional continuing education programs. In addition, many of these programs are offered off-campus and in a variety of distance learning formats. The degree programs are competitive, fully accredited, and nationally recognized for their quality graduates.

Program Application, Acceptance, and Continuance

A separate application must be submitted to be considered for acceptance into the health sciences majors. Application information, qualifications, deadlines, and advisors are listed in the specific program sections of this Catalog and on the web site.

Acceptance to the University does not constitute or guarantee acceptance into a health sciences major. Students are notified by the program director of their acceptance and any other program specific requirements such as physicals, immunizations, technical standards, etc. Continuance in the health sciences majors requires strong academic achievement, including successful demonstration of knowledge and use of practical and critical thinking skills in laboratory and in clinical rotations. Criminal background checks may be required as specified in course syllabi. Any student deemed unacceptable for clinical rotation due to results from a criminal background check will not be allowed to complete the program of study.

The College of Health Sciences has developed graduate programs in the health-related professions that prepare individuals for practice, teaching, research, or administration in health-care delivery to meet the needs of the region, the state, and the nation. These programs include Master of Science degrees in community health and dental hygiene, the Master of Science in Nursing degree, the Master of Public Health degree, the Doctor of Physical Therapy degree, the Doctor of Nursing Practice degree, and the Ph.D. in health services research.

School of Community and Environmental Health

3134 Health Sciences Building
757-683-4259
www.hs.odu.edu/commhealth/

TBD, Chair

The School of Community and Environmental Health offers graduate and certificate programs which lead to careers in health services research, public health, community health, health care administration, environmental health, and long-term care administration. The Master of Science in community health offers practicing health care professionals the opportunity to complete their degrees in a distance format.

Doctoral Program in Health Services Research

757-683-4259
www.hs.odu.edu/commhealth/academics/PhD/

TBD, Graduate Program Director

The primary mission of the Ph.D. in health services research is to develop leaders and problem solvers whose professional services will improve the health of the population not only in Eastern Virginia but also statewide, nationally, and internationally. Health services researchers examine health care quality and effectiveness, patient outcomes, access to care, health care costs and financing, primary and managed care, new technologies, and other critical topics. Health services researchers pursue careers in many settings, including academia, professional organizations, research centers, health policy groups, clinical settings, and in federal, state, and local agencies.

The goals of the program are to enable students to conduct and interpret health services research, to formulate and analyze public health policy, to lead programs and organizations that address the health care needs of populations and to work directly with community members to empower them to be a part of the policy formulation process. In accomplishing these goals students in the program will develop the critical skills necessary to assemble and integrate qualitative and quantitative evidence applicable to problem formulation and policy analysis. They will be able to design viable programs, manage resources, and measure the effectiveness of service delivery to populations. Students will be awarded the Ph.D. in health services research after the completion of all University and program requirements for graduate degrees.

Requirements for Admission

Students are admitted to the Ph.D. program in the fall, spring and summer. Applications for admission are reviewed by the Ph.D. in health services research admissions committee which includes the graduate program director. To qualify for admission, an applicant must meet the general University admission requirements at the graduate level as well as specific program requirements, including:

1. A completed master's degree from a program that is accredited by an appropriate specialized accrediting agency or from an institution of higher education that is regionally or nationally accredited; degrees such as M.D., J.D. and D.D.S. are also acceptable;
2. A minimum acceptable grade point average overall for the master's degree;
3. Acceptable overall total score on the Graduate Record Exam (GRE);
4. For those whose native language is not English a TOEFL score of at least 550 (213 for online version);
5. Official transcripts from all institutions of higher education attended;
6. A current curriculum vitae or resume;
7. Three letters of reference from sources capable of commenting on the applicant's readiness and commitment for doctoral studies. At least one, and preferably all letters will be from academic sources; however, letters may also be from professional colleagues;
8. A 1500 word essay discussing the applicant's academic and professional goals. This essay should discuss how the Ph.D. program in health services research will contribute towards meeting their goals.

Prerequisite courses are necessary for students who do not have graduate preparation in basic statistics, research design, health management and basic computer literacy. Prerequisite courses in health delivery systems and community health may be required for students without academic preparation or experience in these areas.

Complete the application form and submit all required materials to the Office of Admissions.

Degree Requirements

1. Satisfactory completion of at least 60 semester hours of graduate level coursework, including all required courses as listed below. (Students who receive two or more grades of C+ or one grade of F may not continue in the program).
2. Two semesters of full-time residency. These do not have to be consecutive.
3. A health services research internship.
4. Acceptable performance on written and oral candidacy examinations in the major field of study at the end of the program coursework. Students may re-take the candidacy exams only once.
5. Successful defense of a dissertation proposal.
6. Completion of a dissertation representing the candidate's ability to conduct scholarly, original research. The quality of the research must be suitable for publication in an academic, peer-reviewed journal.
7. Successful oral defense of the dissertation.
8. Submission of the approved final copy of the dissertation.

Time frames for completion of degree requirement are as follows:

1. The entire process (from admission to dissertation defense) must be completed within eight years. Exceptions to this time limit require the approval of the graduate program director, the department chair, the college dean and the vice provost for graduate studies.
2. Academic credit which is more than eight years old at the time of graduation must be validated by an examination before the work can be applied to a doctoral degree.
3. The dissertation must be completed within five years after the candidacy exams are passed.
4. Dissertations should be defended at least six weeks prior to the end of the semester in which the student expects to graduate.

Each student is required to have an Advisory and Examination Committee that will meet after the first nine hours of coursework are complete. The Advisory and Examination Committee approves the student's planned coursework (plan of study) and conducts the written and oral competency exams at the end of the coursework. Students must maintain good grades.

Curriculum

The coursework consists of 12 credits of health services core courses, 18 credits of research core courses, six credits of health policy core courses and a six credit cognate area. Additionally students complete an internship (three credits), a dissertation seminar (three credits), and 12 dissertation credits. Up to nine hours of coursework may be at the 600 level. Up to 12 hours of graduate credit may be transferred from another university and applied towards the Ph.D. degree. Transfer of credit is approved at the discretion of the guidance committee and the graduate program director.

The Health Services Core (12 credits):

HLSC 801	Introduction to Health Services	3
HLSC 809	Multidisciplinary Approaches to Health Services	3
HLSC 814	Theory in the Health Sciences	3
HLSC 864	Health Economics	3

Research Core (18 Credits):

HLSC 810/ PADM 853	Health Research Design and Application	3
HLSC 811	Health Care Research Methods	3
HLSC 812	Qualitative Research Methods	3
HLSC 813	Measurement of Health Phenomena	3
HLSC 846	Epidemiology	3
PAUP 804	Methods Program Evaluation	3

Health Policy Core (6 Credits)

HLSC 815	Decision Analysis	3
HLSC872	Policy and Politics of Health	3

Culminating Courses (6 Credits)

HLSC 868	Internship in Health Services	3
HLSC 881	Dissertation Seminar	3

Cognate Courses (6 Credits)

Cognate areas offer choices for students to specialize in an area inside and outside of the health arena. Students choose their cognate with the approval of their guidance committee. Some examples are:

- Urban Services
- Epidemiology
- Education of Health Professionals
- Environmental Health
- Engineering Management
- Clinical Research
- Industrial and Organizational Psychology
- Health Psychology
- Modeling and Simulation
- Demography/GIS
- Other areas to be determined by students and faculty

Candidacy Exams (Written and Oral)

The candidacy examination is normally taken during the spring or fall semester in which the last formal graduate credits are completed. Through the candidacy examination, the student's Advisory and Examination Committee in conjunction with the graduate program director shall ensure that the student has demonstrated a mastery of the subject matter in all fields of the program, has an adequate knowledge of relevant literature, and has the ability to identify, utilize, and apply research skills and techniques. To be eligible to take the examination, the student must meet the appropriate school requirements, must have completed or be in the semester of completing all coursework and the internship, must be recommended by his/her Advisory and Examination Committee, and must achieve at least a 3.0 GPA on all coursework taken within the program. Students need to apply to take the candidacy exam using the proper form. The form must be submitted by February 10 to take the exam in the spring semester and by September 10 to take the exam in the fall semester.

Questions for the candidacy examination are based on coursework taken in the core, cognate and culminating areas and require a sophisticated demonstration of skills. The examination is comprehensive in nature and consists of written and oral components. The written section of the exam is taken over a two-day period. Questions for the written exam consist of the problem, case study, or scenario variety and require approximately nine hours of writing time. The oral examination is taken only after all of the components of the written exam are passed. It must be taken in the same semester as the written exam. It extends over a period of approximately one and one-half hours and permits an in-depth discussion of the written topics and other related materials. All parts of the examination are graded pass/fail. Students may retake the exam only once. Parts of the written exam that are not passed on the first attempt need to be re-taken when the exam is offered again. The oral exam can be re-taken in the same semester.

Dissertation (12 credits)

The candidate's program of study culminates in a dissertation representing an original research project which makes a real and significant contribution to health services knowledge and practice. The dissertation provides a demonstration of the student's ability to conduct independent scholarly research in health services research. The dissertation phase begins only after all other degree requirements (coursework, candidacy exams, dissertation seminar) have been completed. Towards this end, the candidate must form a dissertation committee, compose a letter of intent for the dissertation topic and have approved by their committee, and the college human subjects committee or the ODU IRB, write and successfully defend a dissertation proposal, conduct the research necessary to complete the dissertation, write the dissertation, successfully defend it at an oral defense, make any necessary changes and submit a final approved copy. Additionally, all Ph.D. students are strongly encouraged to author at least one journal article based upon their dissertation research.

Dissertation Committee

After the candidacy exams are successfully passed, the dissertation committee is formed by the student with the approval of the graduate program director. A dissertation committee must have at least three members, one of whom is from outside the department of the major field of study. The members of the dissertation committee must all hold doctorates and be graduate certified unless an exception must be approved by the graduate program director, the chair, and the college dean. The committee's purpose is to supervise the entire process from proposal writing and defense through the oral defense of the dissertation. The committee supervises and approves the choosing of a topic, the choosing of a theoretical framework, the development of the research methods, the actual conduct of the research and the writing of the results.

Dissertation Letter of Intent and Proposal

A dissertation starts with a letter of intent. The student will draft a 3-5 page description of the study that he/she is proposing to conduct. This letter should contain the statement of purpose of the study and a brief description of why the topic is important to health services research. The letter should also identify the theoretical framework that will be employed, as well as provide an overview of the proposed methods. Where appropriate, the letter should also have an addendum that indicates the student has permission to use the proposed data source and/or access the proposed population of interest. The dissertation committee needs to unanimously approve the letter of intent in order for the student to write and defend the dissertation proposal.

The dissertation proposal provides a detailed explanation of the research being proposed. It should address the significance of the study, provide a substantive literature review and describe, in detail, the methods that will be used to collect the data. The proposal will be defended in a public forum to which all faculty, staff and students in the college will be invited. The final draft of the dissertation proposal must be available for public viewing two weeks before the defense date. No formal work should begin on the dissertation until the dissertation committee and the graduate program director unanimously approve the dissertation proposal in writing. Dissertation proposals can be defended prior to IRB approval/exemption. However, no data collection or interaction with study participants can ever begin until the dissertation chair and the student have obtained IRB approval or exemption. Approval of the dissertation proposal is NOT a pro forma activity and the student is cautioned never to regard it as such.

Dissertations and Final Oral Defense

The completion of a dissertation is the cornerstone of the Ph.D. program. Through the dissertation, candidates demonstrate that they are prepared to join the company of scholars and to be leaders in health services research. The candidate should work closely with his/her dissertation committee throughout this process. Dissertations must be carefully prepared, publicly available for viewing, defended in a public forum and approved by the dissertation committee, the graduate program director, the department chair and the college dean.

The dissertation committee plays a vital role in the completion of the dissertation. It is expected that the candidate will be in regular communication with the committee chair and members regarding the progress of the study, research results and manuscript drafts. While preparing a dissertation, candidates must be continuously enrolled for a minimum of one credit hour per semester. University resources may not be used unless a candidate is officially enrolled. Advice or assistance from committee members should not be expected unless the candidate is officially enrolled.

Dissertations must be carefully prepared according to ODU guidelines using the most current version of the Guide for the Preparation of Theses and Dissertations (obtained from the Office of Graduate Studies). The APA style manual should be used to cover specific questions of style. However, the requirements of the Guide for the Preparation of Theses and Dissertations take precedence over all the guidelines contained in the APA manual. All proposed dissertation research which involves human subjects must be reviewed and approved by the college or University's Human Subjects Committee. The process and approval must be documented in the text of the dissertation. Once the dissertation is successfully defended and in its final form, the student should ensure that five copies of the dissertation (with all necessary signatures) are given to the Office of the University Registrar for binding and sign the microfilming and copyright agreements. Students can choose to have additional copies bound for their own personal use. All dissertations will be published in Dissertation Abstracts International.

The student works with the dissertation committee to set a defense date and to ensure that the defense date is made public. The student should provide sufficient copies of the dissertation for public viewing at least two weeks before the defense date. The defense itself needs to be publicized two weeks in advance as well. While the defense is publicized and open to the public in general, care should be taken to ensure that all college faculty and administrators and all departmental students receive invitations to the defense. The entire dissertation committee must attend the final oral dissertation defense. After the dissertation defense, the dissertation committee meets in a closed-door meeting to discuss the dissertation defense and to vote on its approval or disapproval. If the dissertation is not approved, it can be defended only once more (at least three months after the initial defense). The final dissertation must be approved through a signature process that includes the dissertation chair, all members of the dissertation committee, the graduate program director, the department chair and the dean of the College of Health Sciences by signature. Note that a dissertation may be approved orally at the final defense, but may still require some editing before the final copy is approved by the committee. The Doctor of Philosophy in health services research will be awarded upon the oral defense of the dissertation, the submission of the final approved copy of the dissertation and the completion of all other program requirements for graduation.

Master of Public Health

<http://hs.odu.edu/hs/academics/mph>
<http://www.evms.edu/hlthpro/mp/index.HTML>

Program Directors

TBD, Old Dominion University
David O. Matson, Eastern Virginia Medical School

Eastern Virginia Medical School and Old Dominion University jointly offer the Master of Public Health (MPH). The State Council on Higher Education for Virginia approved the MPH program in 1999. The MPH program has been fully accredited by the Council on Education for Public Health (CEPH), since 2000. That accreditation was renewed in 2005 for seven years. In addition to the generalist MPH, specializations in environmental health and health promotion/education are available on the ODU campus in a blend of traditional and distance learning instructional models. These hybrid models are ideal for those professionals currently engaged in public health practice, such as sanitarians and environmental health specialists who wish to earn an advanced degree for increased career mobility or to update professional skills and competencies. Other prospective candidates for the MPH are ODU alumni with a Bachelor's of Science in Health Science degree (BSHS). Individuals with a baccalaureate degree in public health, environmental health, and public administration will also find this course of study appealing. Public Health professionals work at a variety of local, state, and federal environmental and public health agencies, as well as with private industry, consulting firms and not-for-profit organizations.

Admission to the Program

Admission to the MPH Program is based upon several criteria, all of which are listed below.

For U.S. Students

- Baccalaureate degree from an accredited college or university
- Undergraduate grade point average (GPA) of at least (2.80) or better. Preference will be given to applicants whose GPA is 3.0 or better
- Two letters of recommendation
- A personal statement relevant to the applicant's decision to pursue a degree in public health
- All applicants need to submit a Graduate Record Examination (GRE) score, taken within the last five (5) years. There is no required score but applicants with less than a 3.00 GPA should consult with the program director prior to taking the GRE
- Additional consideration will be given for appropriate work experience in a health-related field or a baccalaureate degree in a health related field
- All applicants must submit an application packet with completed application, letters of recommendation and a personal statement

For International Students

- A Baccalaureate degree from an accredited college or university with an undergraduate Grade Point Average (GPA) of 3.0 or a demonstration of an equivalent degree.
- Graduate Record Examination (GRE) taken within the last 5 years with a combined score of 1200 on the verbal and quantitative sections and at least a 3.5 on the analytic section for non-probationary admission.
- TOEFL score of 650 for paper-based test and 278 for computer-based test for applicants whose native language is not English.

International students must abide by all U.S. Immigration laws throughout their enrollment in the program. This includes, but is not limited to, qualifying and obtaining a proper visa prior to attendance. For further information, please contact the EVMS Office of Human Resources at 757-446-6043 and the ODU office of International Admissions at 757-683-3701.

Specialty Tracks Available within the MPH

Five specialty tracks are available within the MPH degree program. The Environmental Health (EVNH), Health Promotion and Education (HP&E) and Generalist tracks (GEN) are available from the ODU campus. The Epidemiology and Biostatistics, and Management tracks are available from EVMS.

Curriculum

MPH Program Requirements

A 42 hour curriculum including a public health related capstone project that demonstrates the knowledge and the skill set to assume increasingly responsible positions on the public health sector are required to earn the MPH degree. The program of study consists of 6 core courses for 18 credit hours; 3 specialty core courses for 9 credit hours, and 2 specialty health electives for 6 credit hours. The remaining 9 credit hours may be satisfied through the capstone project for a total of six credit hours and a practicum (a public health project) or grant writing course for 3 credit hours.

MPHO Core (18 credit hours)

MPHO 610 – Introduction to Public Health Practice
MPHO 611 – Fundamentals of Public Health Social and Behavioral Sciences
MPHO 612 – Statistical Reasoning for Public Health
MPHO 613 – Environmental Sciences for Public Health Practice
MPHO 614 – Epidemiology for Public Health Practice
MPHO 615 – Health Services Administration in Public Health

Specialty Health Core (9 credit hours)

Specialty Health Electives (two courses for 6 credit hours)

To be determined in concert with the MPH Advisor.

Culminating Courses (Coursework totaling 9 credit hours)

MPHO 669 – Public Health Practicum (3 credit hours)
MPHO 691 – Grant Writing for Public Health Practice (3 credit hours)
MPHO 689 – Capstone Project (3-6 credit hours)

Non-Matriculated Students/Students Enrolled in Other Degree Programs

Students who are not seeking the Master of Public Health degree may, on a space-available basis and subject to the approval of the instructor, take up to 9 credit hours of MPH courses. If the student is later admitted to the MPH Program, the credit hours will be applied to the degree.

Prerequisite Courses:

ENVH: Students must complete the following courses at the undergraduate level or graduate level: General Biology (8 credits), General Chemistry (8 credits), Introduction to Physics (with a lab) OR Geological Sciences (8 credits), General College Mathematics (preferably pre-calculus level) OR Statistics (3 credits). Students admitted to the Program may enroll in core

courses while satisfying the prerequisites for the environmental health specialization.

HP&E GEN: Students must have an undergraduate statistics course prior to entering the program or prior to enrolling in MPH 612.

Master of Science - Community Health

757-683-4259

TBD, Graduate Program Director

The School of Community and Environmental Health offers graduate programs leading to careers in the nation's health system. Special emphasis in each of the community health (CHP) courses is placed on the examination of current trends, issues, problems, and possible solutions.

The community health program provides a preparatory base for administrative and academic careers in specialties as well as general areas of community health. Emphasis areas are available in community health education/promotion, health-care management, environmental health, and long-term care administration.

Many students who are selected for this program already have professional qualifications in the health-related fields: health education, physical therapy, environmental health, nursing, dental hygiene, or other disciplines. The course of study is designed to promote the development and application of the professional skills required to meet the leadership needs of the community health field in the United States.

The course of study covers a minimum of one full academic year, including summer school. The 36 credit hour program includes required general courses, elective courses in areas of special interest to the student, and opportunities for completion of a practicum or a thesis.

Admission

The selection of community health students is based on several criteria. To qualify for admission, an applicant must meet the general University admission requirements at the graduate level. In addition, the School of Community and Environmental Health requires:

1. Two letters of recommendation from teachers, supervisors, and/or employers.
2. Evidence of a basic foundation of undergraduate courses in the life sciences, behavioral sciences, and social sciences with a minimum 2.80 grade point average. If it is determined that a student is deficient in one of these three general foundation areas, he or she may be required to take additional course work prior to admission or to enroll in undergraduate course work to strengthen the foundation area.
3. A satisfactory Graduate Record Examination (GRE) aptitude score.
4. Work experience or voluntary participation in a health-related agency or program will be evaluated as part of the student's admission package. Students can be admitted who do not have work or volunteer experience, however, students without experience will be required to produce a portfolio of health related volunteer or work experiences that they have acquired during their time in the program.
5. A career-goals paper. This paper asks the applicant to discuss his or her career goals and the relationship of the community health graduate program to those goals. This paper is evaluated by the faculty of the school for the applicant's ability to present a clear sense of professional purpose, as well as his or her ability to write a concise and grammatically acceptable paper.

Requirements

The curriculum includes a 15-credit hour core of community health courses that constitutes the foundation of the program complemented by a minimum of six credit hours of practicum experience or six hours of thesis research. The remaining courses recommended for completion of the program are intended to provide the student with the opportunity to develop an emphasis area that complements the core courses. The emphasis areas are intended to supplement the professional knowledge and skills that the student will apply in the practice of community health. The program, therefore, includes a minimum of 36 hours of course work and examinations as follows:

Core Courses. (15 credit hours) CHP 600, 601, 602, 646 and 651.

Emphasis Area Courses. (15 credit hours): The remaining hours of required credits in the community health program will be earned in advanced courses making up an emphasis area. Current emphasis areas are community health education/promotion, health-care management, environmental health, and long-term care administration. Students may select a program tailored to their professional needs from the emphasis area courses. The program of study must have the advanced approval of the graduate program director and the student's emphasis advisor. Students are advised to consult the graduate

program director and/or the emphasis area advisor in all matters concerning graduate work.

Comprehensive Examinations. All candidates for the Master of Science in community health must pass a written and an oral comprehensive examination covering the course work in the program of study. Comprehensive examinations are administered once a semester during the fall and spring sessions.

Thesis or Practicum Option. Students must complete a six credit practicum (CHP 669) or a six credit thesis (CHP 698). Students electing the thesis option are required to take CHP 640 and either HLSC 711 or HLSC 712 in addition to their core and emphasis requirements.

Emphasis Areas

Community Health Education/Promotion (15 credits)

Jim Neff, Advisor

The focus of the graduate community health program is the education of selected professionals in the philosophy, concepts, and methods used in the promotion of health and in the prevention and management of illness in the community. Courses may be selected from the following: CHP 500, 530, 555, 556, 611, 750, and 775.

Health-Care Management (15 credits)

TBD, Advisor

This emphasis area is for middle-level managers in the health environment and is planned to allow health professionals the opportunity to pursue graduate study to develop and improve their administrative capabilities. Courses may be selected from the following: CHP 630, 633, 635, 715, 720, 772, 775, 787. The management program is offered on Friday evenings through a combination of asynchronous web-based and TELETECHNET educational delivery systems. Basic computer skills are essential to participate in this program.

Environmental Health (22-23 credits)

Anna Jena, Advisor

This emphasis is designed to meet the needs of students seeking graduate education in the environmental health field. The goal of the program is to provide advanced understanding of human health efforts due to interaction with chemical, biological and physical agents in natural and man-made environments. Students may shape the emphasis area to meet their needs in general environmental health, industrial hygiene, occupational safety, or hazardous materials management. This emphasis has specific prerequisite courses at the undergraduate level that must be met. Also, admission to the program is at the discretion of the faculty. In addition to the core course requirements, there are specific course requirements for each concentration area.

Prerequisite Courses. General Biology (8 credits); General Chemistry (8 credits); Introduction to Physics (with a lab) or Ocean, Earth, and Atmospheric Sciences (8 credits); and General College Mathematics or Statistics (3 credits).

Core Courses. Students must take the following required core courses: CHP 600; 601, 602, 646 and 651.

Emphasis Area Courses: ENVH 502, 543, and 566 are required along with six credits from ENVH 501, 522, 526, 540, 545, 561, or other courses as approved by the program advisor. Six credits of thesis or practicum work are also required.

Concentration Area Requirements. Nine to 10 credit hours from the following courses or their equivalents must be taken in one of the following options in order to be eligible for the degree.

General Environmental Health: ENVH 520, 521, 523, 524.

Industrial Hygiene: ENVH 541, 542, 546, 772.

Hazardous Materials Management: ENVH 561, 562, 564, 565.

Occupational Safety: ENVH 506, 507, 525, 526, 570.

Long-Term Care Administration (12 credits)

TBD, Advisor

This emphasis area is designed to meet the Commonwealth of Virginia's requirements to be eligible to take the state and federal examinations for licensure as a nursing home administrator. Completion of the program does not guarantee licensure, but should insure that the exams can be taken. Both CHP

520 and 550 are required, along with a six-credit hour practicum in a nursing home under the supervision of a licensed administrator. The program aims to provide the enrollee with a background in gerontology and health, as well as in administration and management. The person with a background in health care and/or gerontology will need courses in the areas of administration and management. The person with a background in management/administration will need courses in health care and gerontology. All courses must be approved by the program advisor.

Health Care Management Certificate (9 credits)

This graduate-level certificate is designed for working individuals who attend part time. The certificate complements the student's prior academic preparation and work experience, and the credit hours earned through the certificate will be applicable to the M.S. degree in community health with an emphasis in health care management once the student has been accepted into the Master of Science degree program.

The health care management certificate program requires 15 credit hours to be chosen from the following courses: CHP 526, 527, 530, 550, 630, 633, 635, 720, and 772.

Certificate in Occupational Safety (15-16 credits)

The certificate program in occupational safety is designed to prepare students to meet safety standards and guidelines in such areas as business, education and industry with the goal of managing operations to minimize financial losses resulting from accidents, health claims, legal actions and property damage. It is especially attractive to students in majors such as engineering, occupational and technical studies and business who may reasonably anticipate assignment of safety as an additional duty, or to individuals already employed in the environmental health and safety field. Courses taken in the certificate program may be applied to degree requirements at both the undergraduate and graduate levels in environmental health. For completion of the graduate certificate program students must have a minimum cumulative grade point average of 3.00 in all courses taken toward the certificate. After successful completion of the program, a Certificate in Occupational Safety will be awarded.

A total of 15-16 semester hours is required, comprised of three core courses and six to seven hours of electives. Core courses include: ENVH 506, 506, and 525. Electives may be selected from the following courses: ENVH 501, 526, 540, 541, 542, or 546. There are no prerequisites.

Accelerated Program – Bachelor of Science in Environmental Health (B.S.E.H.) to Master of Science in Community Health

Bachelor of Science in Environmental Health (B.S.E.H.) students who have a 3.00 GPA and have senior standing may apply for acceptance into the Bachelor of Science in Environmental Health to M.S. in Community Health accelerated program. This program allows gifted undergraduate B.S.E.H. students the opportunity to take up to 12 semester hours of graduate course work and apply them to both degrees. Other restrictions apply. Students interested in this program should contact the B.S.E.H. program director James English at 757-683-6010 for more information.

Accelerated Program – Bachelor of Science in Health Sciences (BSHS) to Master of Science in Community Health

Bachelor of Science in Health Sciences students who have a 3.00 GPA from each institution attended and who have senior standing may apply for acceptance into the Bachelor of Sciences in Health Sciences to M.S. in Community Health accelerated program. This program allows gifted undergraduate B.S.H.S. students the opportunity to take up to 12 semester hours of graduate course work and apply them to both degrees. Other restrictions apply. Contact the B.S.H.S. director Jacqueline Sharpe at 757-683-4259 for more information.

Gene W. Hirschfeld School of Dental Hygiene

2011 Health Sciences Building

757-683-3338

<http://hs.odu.edu/dental/academics/ms/about.shtml>

Master of Science - Dental Hygiene

757-683-5232

<http://www.hs.odu.edu/dental/academics/ms/about.shtml>

Michele Darby, Graduate Program Director

The challenge of effecting change in the scope and direction of dental hygiene and health care requires expert skills in problem solving, evidence-based decision making, and leadership.

Recipients of the Master of Science degree in dental hygiene develop skills to meet complex national and global health challenges in professional education, knowledge-generation, information transfer, and health care for all members of society. Within a multidisciplinary, multicultural curricular framework that integrates theory, research, and practical experience, the competency-based program links the goals and career aspirations of the student with relevant learning experiences, technologies, and resources to facilitate career advancement. Through specialized skills training, graduates are prepared to assume leadership roles necessary for quality professional dental hygiene care and advancing knowledge and practice.

Solutions to complex health problems need the participation of dental hygienists educated in community health, research, management, education, public policy, and advocacy, just to name a few. Therefore, the program offers distinct specialty areas in which students may focus: education, administration/management, research, marketing, modeling and simulation, and community health. Although graduate education focuses on developing a specialty, such specialization is viewed as secondary to generating evidence-based knowledge and theory through research. Demand for master's level dental hygienists in these key areas of specialization continues to be strong and students are able to develop competencies essential in today's employment market.

Applicants are encouraged to contact the graduate program director to obtain additional information regarding requirements, experiential credit, cognate offerings, travel abroad, practica and externship opportunities. The program is available on campus, online, or as a hybrid of the two. Up to 12 approved graduate credit hours also can be taken at another University and applied toward degree requirements, making this program one of the most flexible in the nation. Other advantages of graduate study at Old Dominion University include the opportunity to engage in learning within the state-of-the-art Dental Hygiene Care Facility and Dental Hygiene Research Center, the hub for independent investigations with other scholars both within and external to the University; the student-focused, nationally/internationally recognized faculty committed to the educational preparation of dental hygienists leading to degrees at advanced levels; and the opportunity to segue to doctoral education in health services research within the College of Health Sciences.

Dental Hygiene Research Center

The ODU Dental Hygiene Research Center is dedicated to conducting quality, multidisciplinary, clinical, and population-based research to explore diagnosis, pathogenesis, and treatment of conditions that are related to overall health and dental hygiene. The Center, officially sanctioned by the University in 2000, is the first facility in the world dedicated solely to dental hygiene research. The Center strives to advance oral and general health through interdisciplinary and multidisciplinary research in collaboration with other academic institutions, medical facilities, private industry, and the community.

The Center represents a research paradigm unique for graduate education in that no other dental hygiene program has such a facility. Research is an integral and essential component of the School of Dental Hygiene's mission. Students experience the link between theory and practice, and collaborate with faculty to

create new knowledge via discovery, apply evidence-based findings, and disseminate information through professional publications and presentations.

Admission Information

To qualify for admission, the applicant must possess a certificate or associate degree from an accredited dental hygiene program and a baccalaureate degree in dental hygiene or a related field. The applicant must have an overall grade point average (GPA) of at least 2.80 (on a 4.00 scale) in undergraduate education and a minimum of 3.00 in the undergraduate dental hygiene major. The official National Board Dental Hygiene Examination passing score, completed recommendation forms from a previous clinical supervisor and dental hygiene program director, two recommendations from academic sources (employer in the field may substitute), a formal written statement of personal goals and objectives, a clinical self assessment, and official transcripts of all college work must also be submitted. Forms are available at www.hs.odu.edu/dental/academics/ms.app.shtml. International applicants must score at least a 550 on the TOEFL, 213 on the TOEFL CBT, or 79 on the TOEFL iBT. Visit <http://admissions.odu.edu/international> regarding international admission and immigration. Also visit the International Student and Scholar Services site at <http://studentaffairs.odu.edu/iss>.

Applicants whose qualifications are slightly below the required level will be considered for admission to provisional status and may be required to take additional course work. The master's degree program is available under the Southern Regional Education Board's (SREB) Academic Common Market. Applicants who are legal residents of Delaware, Kentucky, Louisiana, Mississippi, or South Carolina may enroll, if accepted, as Academic Common Market students at in-state tuition rates. For additional information see <http://www.schev.edu/students/Acmvainstable.asp> and <http://sreb.org/programs/acm/acmindex.asp>.

Students also may be required to take undergraduate courses or non-credit courses to make-up deficiencies in other areas.

Degree Requirements

Students must complete all courses within a six-year time period with a minimum GPA of a 3.0 on a 4.0 scale. Students must also successfully present and defend a thesis research or nonthesis project and pass an oral comprehensive examination. Competencies for the Master of Science in dental hygiene program are found at www.hs.odu.edu/dental/academics/ms/msdhcompetencies.pdf.

Degree requirements include a minimum of 34 semester hours (thesis option) or 37 semester hours (nonthesis option) distributed as follows:

Curriculum Core Requirements. Candidates are required to fulfill a 22 credit hour core requirement to include:

DNTH 514	Educational Concepts for the Health Professional I	3
DNTH 515	Research Methods in the Health Sciences	3
DNTH 516	Administrative Leadership and Professional Development	3
DNTH 604	Clinical Administration and Teaching	4
DNTH 660	Educational Concepts for the Health Professional II	3
DNTH 668	Internship (in specialty area)	3
CHP 640	Data Interpretation Methods for Health Care	3

Specialty Area. Candidates must select one of the six specialty areas (Education, Community Health, Administration/Management, Research, Marketing, and Modeling and Simulation) and complete the required six to 12 credit hours satisfactorily. Each specialty area includes electives chosen to support the specialty area. Students may also be generalists.

Thesis Option. Candidates are required to complete a minimum of six credit hours in:

DNTH 698	Research	3
DNTH 699	Thesis	3

This option requires original thesis research and writing for a total minimum program requirement of 34 credit hours and is considered essential for students interested in developing investigative and data management skills. The student is encouraged to become familiar with possible research areas soon after admission and contact the graduate program director to discuss the research proposal, funding options and the selection of the thesis committee. The student will be provided with a committee consisting of the thesis advisor and two other faculty members selected by the graduate program director and the student. Prior to beginning the research, the student will present a written proposal to the thesis committee for approval.

Candidates choosing the thesis option must satisfactorily complete the thesis at least four weeks prior to graduation with copies delivered to the thesis committee. An oral comprehensive examination and thesis defense will be conducted by the student's thesis committee during the last four weeks of the semester prior to graduation. The cost of the thesis is a student expense.

Nonthesis Option. The nonthesis option consists of a minimum of three credit hours in: Problems in Dental Hygiene (DNTH 602) and three additional credits of elective course work for a total program minimum of 37 credit hours.

This option is designed for students pursuing a less research-oriented program of study. A student in this program is required to complete an in-depth term paper or execute a modest project as approved by the faculty. An oral comprehensive examination and project defense will be conducted prior to graduation.

Writing Proficiency. Students who do not hold an undergraduate degree from Old Dominion University are required to participate in diagnostic writing exercises for evaluation by the staff of the Writing Center. Each student is responsible for making an appointment with the Writing Center to complete this requirement early in the first semester of graduate studies. Students deemed deficient in writing skills will be required to remedy their deficiency through the services of the Writing Center prior to the completion of 15 graduate credits. Students who fail to participate in the diagnostic writing exercise or to complete recommended developmental work through the Writing Center will not be allowed to register for subsequent semesters.

All faculty members in the school require written assignments, which will be evaluated on the basis of form and content. If needed, resources are available through the Writing Center. Graduate students and faculty employ the current edition of the Publication Manual of the American Psychological Association as the standard reference text for written assignments within the School of Dental Hygiene.

Accelerated Bachelor's to Master's Program

Dental hygiene students who have a 3.25 grade point average from each institution attended and who have senior standing may apply to the bachelor's to master's accelerated program. This program allows gifted undergraduate students the opportunity to take up to 12 semester hours of graduate coursework and apply them to both degrees. Consult with the graduate program director for more information.

School of Nursing

www.hs.odu.edu/nursing

3120 Health Sciences Building

757-683-5250

Laurel S. Garzon, Graduate Program Director

The program leading to the Master of Science in Nursing is designed to prepare graduates with expertise in theory, research, and advanced nursing practice. Through academic courses and clinical experiences, graduate students are prepared to meet the present nationwide demand for nurses in advanced practice, leadership and education as well as to pursue doctoral study. The master's program in nursing is fully accredited by the Commission on Collegiate Nursing Education.

Students in the program may specialize in a variety of roles. All specialties emphasize development of the nursing role through advanced theory and research. The program strives to instill in its graduates leadership responsibility, professional commitment, and a holistic approach to health and nursing care.

The number of credits required for the Master of Science in Nursing degree varies and reflects the number of hours in the core plus the hours required for certification in a specialty. The nurse anesthesia role option requires 83 credits. Nurse practitioner role options include family nurse practitioner (47 credit hours) and women's health nurse practitioner (45 credit hours). There is a joint program with Shenandoah University in nurse midwifery that is 47 credits. There are two 36 credit hour web-based programs: nurse administrator and nurse educator.

Programs are available for certified advanced practice nurses in anesthesia (CRNA) and nurse practitioners to obtain the MSN. Also available are, post-master's programs for M.S.N. prepared nurses to obtain nurse practitioner and nurse anesthesia preparation.

Admission to the Graduate Program

1. In addition to meeting University and college requirements, applicants must have:
2. Completed a baccalaureate degree with an upper-division major in nursing from a National League for Nursing accredited college or university program, a Commission on Collegiate Nursing Education accredited college or university program or the equivalent.
3. Demonstrated graduate potential by satisfactory scholastic achievement in the baccalaureate nursing program (grade point average of 3.00 on a 4.00 scale).

- Completed an undergraduate course in statistics.
- Completed a health assessment component (undergraduate or continuing education).
- Attained a satisfactory score on the Miller Analogies Test (MAT) or the Graduate Record Examination (GRE), taken within the past five years.
- A current license as a registered nurse.
- At least one year of recent clinical nursing experience. Applicants for the nurse anesthesia role must have at least one year of clinical experience in critical care nursing.
- Presented three letters of professional reference, including one from the dean or a member of the nursing faculty in the baccalaureate program in nursing and one from the most recent employer.
- Completed the Supplementary Application for Admission to the Master of Science in Nursing Program, including the short essay (500 to 700 words) describing professional and academic goals, and how graduate study in nursing will contribute to the fulfillment of these goals.

An interview is strongly advised for prospective students. Also, students applying to the nurse anesthesia program should contact the director of the nurse anesthesia program at (757) 683-5068. For full consideration, applications for the nurse anesthesia program must be submitted by December 1 of the year prior to the August starting date. Students applying to the post-master's program must have a master's degree in nursing.

Degree Requirements

In addition to general University requirements, the following apply to candidates for the Master of Science in Nursing degree:

- Only degree-seeking students may take graduate nursing courses.
- Full-time or part-time study is available for most roles. Part-time students are required to complete all program requirements within a six-year period. Some roles have only full-time programs. Contact the graduate nursing office regarding study options for each program at (757) 683-4298.
- A written comprehensive examination covering the program of study is required by the final semester of study for students not electing to complete a thesis. A comprehensive examination in the role specialty is required for all postmaster's students. A student must be registered in the semester the comprehensive exam is taken.
- The student must make arrangements three months in advance to take a nursing course with a laboratory or practicum component to assure appropriate and available placement for the learning experience. Arrangements are made through the role coordinator.
- The B grade (3.00) is the minimal acceptable grade for all courses with a NURS or NURA prefix or any course required for the degree for continuation in the master's program. Satisfactory performance in the laboratory or practicum component of a nursing course is required. Students achieving less than a B grade (3.00) in a nursing course may request an opportunity from the graduate program director to repeat the course once. Two course failures will result in termination from the nursing program. Students may not progress with an incomplete in prerequisite courses as listed in the curriculum plan.

Additional requirements such as physical exams, CPR certification, immunization requirements, professional liability insurance, computer competencies and technical standards and background checks for the School of Nursing are also available in the Nursing Student Handbook and on the School of Nursing web page.

Master of Science in Nursing – Women's Health Nurse Practitioner Role

Cindy Little, Coordinator

The Women's Health Nurse Practitioner track in the graduate nursing program is designed to provide students with education and experience to become primary care providers in women's health. Graduates are qualified to take the Women's Health Nurse Practitioner certification examination offered by the National Certification Corporation. Students participate in a variety of women's health practice experiences with preceptors and are required to complete clinical practice in primary adult health. All courses in the previous semester must be completed, according to the full-time or part-time curricula, prior to entry in subsequent semester courses. Co-requisite courses are listed.

Women's health nurse practitioner- full-time curriculum

First Year First Semester		Corequisites
NURS 610	Theoretical Foundations of Nursing	3
NURS 661	Pharmacotherapeutics in Advanced Practice	3 N 670, 671, 672

NURS 670	Advanced Pathophysiology	3	N 671,672
NURS 671	Advanced Physical Assessment Seminar	1	N 670, 672
NURS 672	Advanced Physical Assessment Laboratory	1	N 670, 671
NURS 714	Family Focused Primary Care	1	
First Year Second Semester			
NURS 611	Research Design	3	
NURS 658	Advanced Nursing Practice in Womens' Health I	2	N 664, 762
NURS 663	Health Promotion and Maintenance	2	
NURS 664	Primary Care Approaches for Women	3	N 658, 762
NURS 762	Advanced Family Nursing I: Management Of Acute Illness	3	N 664, 658
First Year Third Semester			
NURS 613	Issues in Advanced Nursing Practice	3	
NURS 640	Research Methods	3	
NURS 659	Advanced Nursing Practice in Womens' Health II	2	N 787
NURS 787	Advanced Perinatal Nursing	3	N 659
Second Year First Semester			
NURS 660	Advanced Nursing Practice in Womens' Health III	6	N 668
NURS 686	Synthesis of Advanced Practice Concepts	3	N 660
Total Credits		45	

Master of Science in Nursing – Family Nurse Practitioner Role

Micah Scott, Coordinator

The family nurse practitioner (FNP) role prepares graduate students to provide a full range of primary care services to individuals and families throughout the life span. In collaboration with other health care professionals, graduate students provide health promotion, health maintenance and restorative care to well, at-risk, and chronically ill clients and their families. Student clinical experiences are provided in a variety of primary care settings. Successful completion of the program qualifies students to register for the AANP or ANCC examination for certification as a family nurse practitioner.

Degree Requirements

Full-time and part-time curricula are available. No FNP course may be taken unless admitted to the FNP program. Unless specifically stated, all courses in the previous semester must be completed before taking courses in the subsequent semesters unless admitted to the part-time curriculum. Course work may be completed according to the full-time or part-time curriculum. NURS 661, 670, 671, 672 and are prerequisites to all FNP content course and clinical courses except NURS 663.

Full-Time Curriculum

First Year First Semester		Corequisites
NURS 610	Theoretical Foundations for Nursing Practice	3
NURS 661	Pharmacotherapeutics for Primary Health Care Providers	3
NURS 670	Advanced Pathophysiology	3 NURS 671, 672
NURS 671	Advanced Physical Assessment Seminar	1 NURS 670, 672
NURS 672	Advanced Physical Assessment Laboratory	1 NURS 670, 671
NURS 714	Family Focused Primary	1
First Year Second Semester		
NURS 611	Research Design	3
NURS 663	Health Promotion and Maintenance	2
NURS 664	Primary Care Approaches for Women	3 NURS 665, 762
NURS 665	Advanced Family Nursing I Practicum	2 NURS 664, 762
NURS 762	Advanced Family Nursing I: Management of Acute Illnesses	3 NURS 664, 665
First Year Third Semester		
NURS 613	Issues in Advanced Practice Nursing	3
NURS 640	Research Methods	3 NURS 611
NURS 705	Primary Care Approaches for Children	3 NURS 764
NURS 764	Advanced Family Nursing II Practicum	4 NURS 705
Second Year First Semester		
NURS 765	Advanced Family Nursing II: Management of Chronic Illnesses	3 NURS 767, 768
NURS 767	Advanced Family Nursing III Practicum	5 NURS 765, 768

Doctor of Nursing Practice (DNP)

The Doctor of Nursing Practice (DNP) degree will provide additional education for advanced practice nurses in: (1) advanced diagnostics and practice skills, (2) care of the underserved and increasingly diverse population and (3) incorporation of emerging care technologies. It is designed as a post MSN degree. The program may be completed as a full-time or part-time student and is distance friendly.

In order to graduate from Old Dominion University's DNP Program, a student must have successfully completed all 36 post-masters credit hours of required course work, including a clinical research project and all clinical residencies. In addition, he or she must have passed a comprehensive examination that is given in the fall semester of the final year during the final clinical residency. It will take a full-time student four semesters (spring, summer, fall and spring) to complete the program. A part-time student will complete the DNP program in seven semesters (spring, summer, fall, spring, summer, fall, and spring.)

Full Time Curriculum

First Semester

NURS 800	DNP Integrative Concepts I	3
NURS 802	The Business of Practice	2
CHP 646	Epidemiology	3
NURS 865	Clinical Residency for Advanced Practice I	1
Total		9

Second Semester

NURS 801	DNP Integrative Concepts II	3
NURS 806	Practice-Based Research/Evaluation	4
NURS 866	Clinical Residency for Advanced Practice II	2
Total		9

Third Semester

NURS 803	Leadership/Management in Healthcare	3
NURS 807	Informatics/Database Management	3
NURS 867	Clinical Residency for Advanced Practice III	3
Total		9

Fourth Semester

NURS 809	Health Care Planning and Policy for	
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Nurse Anesthesia Specialty-

Michael Jackson, Coordinator

The Master of Science in Nursing program in nurse anesthesia is an 83-credit, 28-month program beginning in late August. During the first year, the program is designed to introduce students to the basic theoretical knowledge and skills necessary for advanced nursing practice in nurse anesthesia. The first 12 months of the program are primarily didactic. The last 16 months of the program are the clinical component comprised of both general and regional anesthesia techniques for surgery and clinical specialties such as eyes, ears, nose and throat, neurosurgery, vascular surgery, open heart, obstetrics, trauma, and organ transplants. During this phase of the program, the student returns to the classroom on a weekly basis for extensive clinically related study.

Upon successful completion of the 28-month program, the graduate receives the M.S.N. degree, and becomes eligible to write the National Certifying Examination for Nurse Anesthetists given by the Council on Certification of Nurse Anesthetists. Graduates successfully completing this exam become Certified Registered Nurse Anesthetists (CRNAs).

A prerequisite for enrollment in the first year first semester is degree seeking status and admission to the MSN-Nurse Anesthesia track. Successful completion of courses in the previous semester is a prerequisite for enrollment in the next semester. All courses within a semester are corequisites and must be taken together.

Full-Time Curriculum

First Year First Semester

NURS 610	Theoretical Foundations for Nursing Practice	3
NURS 646	Structure & Function for Advanced Nursing Practice I	3
NURA 650	Medical Physical Sciences	3
NURA 654	Professional Aspects of Anesthesia	3
NURA 660	Pharmacotherapeutics for Nurse Anesthesia	3

First Year Second Semester

NURS 611	Research Design	3
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Total Credits

47

	Advanced Practice	3
NURS 890	DNP Capstone	3
NURS 868	Clinical Residency for Advanced Practice IV	3
Total		9

Total for the Program

36

Certified Nurse Practitioner to MSN Program

Laurel S. Garzon, Coordinator

This program is designed to offer the Certified Nurse Practitioner an opportunity to complete the MSN with content applicable to organizational, business, research, outcome assessment, informatics, and community health dimensions of advanced practice. The program requires completion of a nine credit MSN core curriculum and 15 credits of required graduate nursing courses and six credits of electives.

First Year First Semester

NURS 610	Theoretical Foundations of Nursing Practice	3
NURS 686	Synthesis of Advanced Practice Concepts	3
NURS 735	Organizational Leadership	3

First Year Second Semester

NURS 611	Research Design	3
NURS 740	Strategic Leadership	3
NURS	Elective	3
NURS	Elective	3

First Year Third Semester

NURS 613	Issues in Advanced Nursing Practice	3
NURS 640	Research Methods	3
NURS 745	Visionary Leadership	3

Elective courses:

The student will select six credits from graduate nursing courses. These may include courses in the family nurse practitioner and pediatric nurse practitioner programs with permission of the instructor. Other elective courses include:

NURS 620	Professional Relationships and Human Resource Management	
NURS 780	Financial Issues in Nursing Administration	
NURS 647	Structure & Function for Advanced Nursing Practice II	3
NURA 651	Pharmacology of Anesthesia Drugs	4
NURA 652	Principles of Anesthesia Practice I	4

First Year Third Semester

NURS 640	Research Methods	3
NURS 648	Disease Processes for Advanced Practice	2
NURA 653	Principles of Anesthesia Practice II	2
NURA 694	Advanced Physical Assessment	3
NURA 754	Anesthesia Practicum – Orientation to the Operating Room	4

Second Year First Semester

NURA 655	Principles of Anesthesia Practice III	4
NURA 755	Clinical Practicum A	6

Second Year Second Semester

NURA 756	Clinical Practicum B	10
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Second Year Third Semester

NURA 757	Clinical Practicum C	10
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Third Year First Semester

NURA 758	Clinical Practicum D	10
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Total Credits 83

Certified Registered Nurse Anesthetists (CRNAs) to MSN Program

Michael Jackson, Coordinator

The Master of Science in Nursing program for Certified Registered Nurse Anesthetists (CRNAs) is a 30-credit degree program beginning yearly in August. The curriculum consists of nine credits of core nursing courses; nine credits of nursing elective courses; and 12 hours of Advanced CRNA clinical courses. Applicants for the CRNA/MSN role must submit a professional portfolio and academic credentials for review prior to admission to the MSN program. If there are deficiencies in preparation at the bachelor's level, courses from the R.N./B.S.N. program may be required.

Certified Registered Nurse Anesthetist

Full-Time Curriculum

First Year First Semester

NURS 610	Theoretical Foundations for Nursing Practice	3
NURS	Graduate Nursing Elective	3

First Year Second Semester

NURS 611	Research Design	3
NURS	Graduate Nursing Elective	3

First Year Third Semester

NURS 640	Research Methods	3
NURS	Graduate Nursing Elective	3

Second Year First Semester

NURA 759	Clinical Practicum	12
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Total Credits 30

Pre Requisites

NURS 611

Nurse Administrator Role

Laurel Garzon, Coordinator

The Nurse Administrator role prepares the graduate for leadership positions in an integrated delivery system. The curriculum is designed to provide the graduate student with knowledge and advanced problem solving skills to address community and organizational issues. New models of health care delivery and the role of the advanced practice nurse in assuring effective organizations and healthy communities are analyzed.

Specialty courses focus on leadership skills in communities and organizations, needs assessments, group and organizational strategies, program development and health care evaluation. During internships students may investigate a variety of health problems or care delivery issues in either acute care or community-based settings.

Nurse Administrator (Full-time Curriculum)

First Semester (Fall)

NURS 610	Theoretical Foundations for Nursing Practice	3
NURS 616	Organizational Leadership: Transformational Strategies in Focus Area	2
NURS 732	Health Populations, Diversity and Outcomes	3
NURS 735	Organizational Leadership	3
Total Credits		11

Second Semester (Spring)

NURS 617	Strategic Leadership: Transformational Strategies in Focus Area	2
NURS 611	Research an Introduction to Design	3
NURS 620	Professional Relationships & Human Resources Management	3
NURS 740	Strategic Leadership	3
NURS 780	Financial Issues in Nursing Administration	3
Total Credits		14

Third Semester (Summer)

NURS 613	Issues In Advanced Nursing Practice	3
NURS 618	Visionary Leadership: Transformational Strategies in Focus Area	2
NURS 640	Research Methods	3
NURS 745	Visionary Leadership	3
Total Credits		11

Total Credits (program)

36

Nurse Educator Role

Karen Karłowicz, Coordinator

This initiative is a collaboration between Old Dominion University's School of Nursing, the schools of nursing in the Virginia Community College System and other schools of nursing within and outside of Virginia. Old Dominion has a long-standing relationship with these partners in the TELETECHNET graduate nursing programs.

This initiative offers an M.S.N. and post-master's certificate program to prepare nursing educators. The 36-credit program may be completed in one year full-time or two years part-time, or as a 15-credit post-master's certificate. In addition to the required MSN core content on nursing theory, research and issues of practice, the curriculum includes courses on teaching methods, technology in education, evaluation methods, incorporating diversity into the education process, strategies for student and faculty success, and mentored teaching experiences. The community college nursing faculty will serve as experts and preceptors for the internship experiences. The courses will be offered using a combination of distance technologies, including televised classes, web based courses, videoconferences, video evaluation of teaching experiences and mentored teaching internships.

Full-Time Curriculum

First Year First Semester (Fall)

NURS 610	Theoretical Foundations for Nursing Practice	3
NURS 634	Nurse Educator/Faculty Internship I: Classroom Instruction (Eight hours/week-focus in classroom teaching)	2
NURS 636	Instructional Delivery Methods in Nursing Education	3
NURS 732	Health Populations, Diversity and Outcomes	3
Total Credits		11

First Year Second Semester (Spring)

NURS 611	Research Design	3
NURS 644	Clinical Teaching Methods for the Nurse Educator	2
NURS 645	Nursing Curriculum Design and Course Development	3
NURS 649	Nurse Educator/Faculty Internship II: Clinical Instruction (Eight hours/week-focus clinical teaching)	2
NURS 620	Professional Relationships & HR Management	3
Total Credits		13

First Year Third Semester (Summer)

NURS 613	Issues In Advanced Nursing Practice	3
NURS 640	Research Methods	3
NURS 654	Assessment and Evaluation in Nursing Education	3
NURS 676	Professional Ethical and Legal Concepts of Nursing Education	3
Total Credits		12

Total Credits (program)

36

Internship courses: The internships will be arranged with a faculty mentor and provide eight hours a week of supervised education experience focusing on faculty teaching.

Nurse Midwifery (cooperative program with Shenandoah University)

Program Coordinators

Cindy Little, ODU Coordinator

Julianna Fehr, Shenandoah University Coordinator

The Master's in Nursing, with specialization in nurse midwifery, is a joint program with Shenandoah University. The two-year program includes advanced practice nursing content offered by Old Dominion University in the Hampton Roads region at eight TELETECHNET distance sites in Virginia during the first year. The second year in the midwifery program is at Shenandoah University. The Master of Science in Nursing is awarded by Old Dominion University and a certificate of midwifery specialty is awarded by Shenandoah University. Graduates are eligible to take the national midwifery certification examination. The program may be completed as a full-time or part-time program.

The obtain information about the program please contact Sue Parker at 757-683-4298 or sparker@odu.edu

Nurse Midwifery

Fall Semester (ODU)

NURS 610	Theoretical Foundations of Nursing	3
NURS 661	Pharmacotherapeutics in Advanced Practice	3
NURS 670	Advanced Pathophysiology	3
NURS 671	Advanced Physical Assessment Seminar	1
NURS 672	Advanced Physical Assessment Laboratory	1
NURS 714	Family Focused Primary Care	1
Total Credits		12

Spring Semester (ODU)

NURS 611	Research Design	3
NURS 663	Health Promotion and Maintenance	2
NURS 664	Primary Care Approaches for Women	3
NURS 658	Advanced Nursing Practice in Women's Health I	2
Total Credits		10

Summer Semester (ODU)		
NURS 613	Issues in Advanced Nursing Practice	3
NURS 640	Research Methods	3
Total Credits		6
Fall Semester (SU)		
NM 610	Primary Care of Women	3
NM 620	Comprehensive Antepartal Care	3
Total Credits		6
Spring Semester (SU)		
NM 630	Midwifery Practicum	3
NM 640	Comprehensive Perinatal Care	3
Total Credits		6
Summer Semester (SU)		
NM 650	Integrated Midwifery Practicum	6
NM 660	Advanced Nurse-Midwifery Role Development	1
Total Credits		7
Total Credits (program)		47

Post-Master's Certificate Program

This program of study is designed to provide Master of Science in Nursing prepared registered nurses with the knowledge and skills needed to register for an examination to certify as a family nurse practitioner, pediatric nurse practitioner, nurse anesthetist, and women's health practitioner. Individual programs of study are developed based upon the applicant's previous experience and education.

School of Physical Therapy

3118 Technology Building
757- 683-4519
www.hs.odu.edu/physther/

Martha Walker, Chair and Graduate Program Director

Doctor of Physical Therapy Degree

The Doctor of Physical Therapy program is designed to professionally prepare students with the knowledge and clinical experiences to become licensed physical therapists who will enter general physical therapy practice. Upon graduation, students will be prepared to sit for licensure in any United States jurisdiction and practice in any health care setting where physical therapy is offered. The curriculum consists of 117 credit hours over a three-year period of time including summers. There are five full-time clinical internships totaling 40 weeks. The first three are completed over the second and third summers, with the final 16 weeks of clinical education occurring in the spring semester preceding graduation. A variety of clinical facilities locally, throughout Virginia, and the United States are used for internship experiences. Students are responsible for providing their own transportation to these off-campus clinical sites.

Requirements for Admission

Students are admitted to the program after completion of a bachelor's degree and prerequisite course work. For preferential consideration, the application deadline is November 1 of each year. Applications will continue to be accepted and reviewed on a case-by-case basis until each class is filled. Specific procedures for admission must be followed including the verification of meeting the technical standards. Admission into the program is competitive.

An application to the University and a separate application to the Physical Therapy Centralized Application Service (PTCAS) must be submitted. Applications may be obtained by calling (757) 683-4409, downloading the application forms from the Web. The PTCAS website will be open to applicants August 1 each year at www.PTCAS.org. Please follow the directions for application found at the PTCAS site.

A competitive admission process is used for determining acceptance. Qualified high school students may apply for admission with guaranteed entry into the Doctor of Physical Therapy program. For criteria and additional information, please contact the Office of Admissions (800-348-7926 or 757-683-3685) or the College of Health Sciences advisor at (757) 683-5137.

Degree Requirements

Prerequisite course include the following: STAT 130M; BIOL 115N; CHEM 115N-116N or 101N-102N; PHYS 111N-112N; BIOL 250 and 251; PSYC 201S or 203S; social studies elective (3 credit hours). An introductory course in kinesiology (EXSC 416) is recommended but not required.

Students are required to pass written and oral comprehensive examinations prior to graduation. Comprehensive examinations take place in the final academic semester prior to the terminal two clinical internships.

Curriculum /Course Titles and Credits

Curriculum Schedule

Year 1

Summer

PT 621	Introduction to Physical Therapy	2
BIOL 889	Advanced Human Anatomy	6

Fall

PT 627	Theory & Practice I	4
PT 630	Concepts in Histology for PT	1
PT 634	Clinical Science I	3
PT 640	Patient Evaluation I	3
PT 655	Clinical Problem Solving I	2
PT 665	Biomechanics I	3
PT 792	Neuroscience I	3

Spring

ESPR 630	Exercise Physiology	3
PT 628	Theory & Practice II	4
PT 635	Clinical Science II	3
PT 641	Patient Evaluation II	3
PT 656	Clinical Problem Solving II	1
PT 666	Biomechanics / Kinesiology II	2
PT 793	Neuroscience II	3

Year II

Summer

PT 669	Clinical Internship I	4
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Fall

PT 810	Scientific Inquiry I	3
PT 826	Theory & Practice III	4
PT 836	Clinical Sciences III	3
PT 842	Patient Evaluation III	3
PT 857	Clinical Problem Solving III	2
PT 884	Clinical Teaching and Professional Communication	3

Spring

PT 822	Scientific Inquiry II	2
PT 827	Theory & Practice IV	4
PT 837	Clinical Science IV	3
PT 837	Clinical Problem Solving IV	1
PT 865	Prosthetics & Orthotics	3
PT 881	Management of Special Populations	2
PT 895	Topics in Physical Therapy	1

Year Three

Summer

PT 871	Clinical Internship II	4
PT 872	Clinical internship III	4

Fall

PT 892	Scientific Inquiry Seminar	1
PT 880	Psychosocial Aspects of Patient Care	2
PT 882	Practice Management	3
PT 890	Differential Diagnosis Seminar	3
PT 883	Professional Issues in Physical Therapy	2
PT 891	Seminar in Integrative Case Studies	3

Electives - choose 1

PT 894	Topics in Advanced Practice Management	2
PT 896	Topics in Professional Practice Expectations	2
PT 897	Topics in Clinical/Population/Community-based Research	2

Spring

PT 873	Clinical Internship IV	4
PT 874	Clinical Internship V	4

Total Credits (program) 117

Licensure Options

Upon successful completion of all requirements and graduation from the Doctor of Physical Therapy program, graduates are qualified to apply for and sit for licensure in any of the fifty states, District of Columbia, Guam and Puerto Rico.

Continuing Education Programs

www.odu.edu/hsce

Short courses, national conferences, workshops, refresher courses, certificate programs and seminars are offered by the different schools in the college on and off campus on a noncredit continuing education (CEU) basis. Professional continuing education programs cover a wide range of topics, including environmental health, dental hygiene, dental assisting, nursing, nuclear medicine technology, health-care management, medical technology, physical therapy, community health, mental health, and chemical dependency.

Continuing education serves the following functions: (1) licensure and certification for professionals and practitioners, (2) credential and degree achievement and (3) professional development to update knowledge and skills. Clientele served by the programs include nursing and allied health

professionals, human service workers, managers and supervisory personnel, technicians, laboratory personnel, and health educators.

Visit the website to view current offerings.

The Dental Hygiene Research Center

The focus of the Center is to support research through collaborations and partnerships that will provide a foundation for dental hygiene services and practice, advance the practice of dental hygiene, and improve the oral health status of the public. Research capabilities are multifaceted with a wide variety of projects relating to occupational risk assessment as well as product and device testing. Multidisciplinary and interdisciplinary projects are developed with health care facilities, private industry, and other academic institutions. Undergraduate and graduate students are integrated into the research process, which contributes to the understanding between theory and practice.

College of Health Sciences Graduate Courses

Course Prefixes

Community Health Professions — CHP
Dental Hygiene — DNTH
Environmental Health — ENVH
Health Sciences — HLSC
Master of Public Health — MPH
Medical Laboratory and Radiation Sciences — MLRS
Medical Technology — MEDT
Nurse Anesthesia — NURA
Nursing — NURS
Physical Therapy — PT

Community Health Professions — CHP

CHP 400/500. Ethics in Health Administration. Lecture 3 hours; 3 credits. A survey of philosophical problems common to health sciences, including an analysis of the nature of health in its historical and contemporary contexts.

CHP 415W/515. Critical Issues in Public/Community Health Administration. Lecture 3 hours; 3 credits. Identification and analyses of critical issues currently facing public/community health and the American health care system.

CHP 420/520. Foundations of Gerontology. Lecture 3 hours; 3 credits. Prerequisite: permission of instructor. Focuses on changes in the characteristics, status, and roles of the elderly; personality development, mental health, and adjustment of individuals with emphasis on biophysical and psychosocial processes as they influence capacity and performance in the elderly.

CHP 425/525. Health Aspects of Aging. Lecture 3 hours; 3 credits. Prerequisite: CHP 420/520 or permission of the instructor. Identifies major issues and problems in meeting health care needs of the aged. Emphasis on role of social assets and supports in determining effects of life changes on the aging process.

CHP 426/526. Skills in Health Services Administration I. Lecture 2 hours; 1 hour web; 1-3 credits. Prerequisite: permission of instructor. Introduction of basic concepts which will allow for development of critical skills in a variety of managerial areas pertinent to the delivery of health care. Prerequisite: permission of instructor. Experts in various fields will provide students with useful strategies used in the administration of health care services.

CHP 427/527. Skills in Health Services Administration II. Lecture 2 hours; 1 hour web; 1-3 credits. Prerequisite: permission of instructor. Continuation of basic concepts and development of critical management skills pertinent to the delivery of health care. Experts in various fields will provide students with useful strategies in the administration of health care services.

CHP 430W/530. Community Health Resources and Health Promotion. Lecture 3 hours; 3 credits. Prerequisite: permission of instructor. Designed to provide information about community health resources.

CHP 440/540. Finance and Budgeting in Healthcare. Lecture 3 hours; 3 credits. Prerequisite: junior standing. This course covers financial management functions in healthcare organizations including operating and capital budgeting processes along with budgeting and financial controls.

CHP 450/550. Public and Community Health Administration. Lecture 3 hours; 3

credits. Prerequisite: permission of instructor. A review of the principles and practice of administering public and community health organizations and programs at federal, state, and local levels. Constitutional, statutory and administrative bases for organizing and conducting public/community health programs will be discussed.

CHP 455/555. Interpersonal and Counseling Skills for Health Professionals. Lecture 3 hours; 3 credits. Prerequisite: permission of instructor. Study and practice in human relations for health practitioners. The course is designed to incorporate the latest and best techniques from the health sciences with a "therapeutic use of self."

CHP 456/556. Substance Use and Abuse. Lecture 3 hours; 3 credits. Prerequisite: permission of instructor. Focuses on facts about drugs and drug abuse, on value judgments concerning drugs, and on interaction of facts and value judgments. Emphasis is on drug abuse prevention.

CHP 465/565. Policy and Politics of Health. Lecture 3 hours; 3 credits. Prerequisite: junior standing. This course will explore both health policy and the politics of health. Students will develop an understanding of the systematic and analytical framework for developing health and health care policy issues.

CHP 470/570. Death, Dying and Survivorship. Lecture 3 hours; 3 credits. Prerequisite: permission of instructor. Utilizes readings from sociology, psychology, literature, art, law, religion, and the medical and nursing sciences to explore death in its personal, cultural and professional significance. Audiovisual presentations and guest speakers will provoke thought and discussion to allow students to come to terms with their attitudes toward death and assist others in dealing with this important life experience.

CHP 480/580. Health Ethics and the Law. Lecture 3 hours; 3 credits. Prerequisite: permission of instructor. This course provides the students with a basic knowledge of health law and examines legal issues confronting health services administrators in various health care environments.

CHP 485/585. Health Informatics. Lecture 3 hours; 3 credits. Prerequisite: junior standing. This course focuses on healthcare informatics (information systems) and application in health care organizations. It provides an overview of health information system concepts, management, and integration of technology in healthcare organizations.

CHP 495/595, 496/596. Topics in Public/Community Health Administration. 1-3 credits. Prerequisite: permission of the instructor. This course provides the opportunity for the study of selected topics in public/community health, including informatics, under the supervision of a faculty member.

CHP 497/597. Readings in Public/Community Health Administration. 1-3 credits. Prerequisite: permission of the instructor. This course provides the opportunity for advanced investigations of selected issues/concerns in public/community health administration, under the supervision of a faculty member. It must be taken by students who wish to pursue topics not covered by regularly scheduled courses.

CHP 600. Principles of Community Health. Lecture 3 hours; 3 credits. The course will

provide an introduction to the relationship between health status, the current multifaceted delivery system and the social and political aspects of the community. Topics of this course include community health education, sanitation, mental health, maternal and child health, and others.

CHP 601. Research Design and Evaluation in the Health Professions. Lecture 3 hours; 3 credits. This course is designed for graduate students in the health professions to explore the concepts, problems, needs, and issues in both conducting research and evaluation and in analysis of research related to the health professions. An understanding of statistics is strongly advised.

CHP 602. Principles of Environmental Health Science and Protection. Lecture 3 hours; 3 credits. An introduction to the chemical, physical and biological factors affecting human health and well being. The emphasis is on the application of controls to prevent disease and maximize environmental quality. (Cross-listed with ENVH 600)

CHP 611. Social and Cultural Aspects of Public Health and Illness. Lecture 3 hours; 3 credits. Scholars will gain an understanding of social and cultural issues associated with public health and illness through discussion, application of principles and theories and an interactive case study. Scholars will identify personal and social influences on public health and discuss health disparities and community health needs. Special attention will be paid to populations bound by shared risks and behaviors.

CHP 630. Health Care Marketing. Lecture 3 hours; 3 credits. This course is devoted to exploring the fundamentals of marketing as they relate to the health care environment. Emphasis will be placed on marketing of new programs, including health-promotion programs. It provides a survey of marketing activities as they relate to the health care environment.

CHP 633. Financing Health Care. Lecture 3 hours; 3 credits. Students will examine financial evaluation of the health care industry, the source of funds, and the effects of changing patient policies. Other topics of interest will be financial strategies, budgets, and capital outlay. (cross-listed with MPH 733)

CHP 635. Managed Care. Lecture 3 hours; 3 credits. This course provides the student all the basic information needed to learn critical concepts of managed care. It explores topics ranging from the roots of managed care to types of managed care organizations, negotiating and contracting for services, controlling utilization and using data reports in the management of managed care organizations. In addition, the course addresses the future of managed care in the turbulent, dynamic health care environment.

CHP 637. Issues In Health Care Administration. Lecture 3 hours; 3 credits. This course explores current issues/trends faced by health care/institutions in the constantly evolving health care environment. Topics such as the impact of shift in service delivery from inpatient to outpatient care, development of multihospital systems and hospital alliances, prospective payment systems, retrospective payment systems and many other critical issues will be addressed.

CHP 640. Data Interpretation Methods for Health Care. Lecture 3 hours; 3 credits. A variety of procedures for interpreting research data collected in health care settings will be explored. To be included are univariate, bivariate,

and multivariate procedures appropriate with parametric and non-parametric data. Related topics: probability hypothesis testing and measuring strength of relationships between/among variables.

CHP 646. Epidemiology. Lecture 3 hours; 3 credits. This course examines epidemiology as a method for viewing inborn community health problems and as a body of knowledge derived from this method. Skills in using epidemiology as a method and as knowledge to solve community health problems will be included.

CHP 651. Public and Community Health Administration. Lecture 3 hours; 3 credits. A review of the principles and practice of administering public and community health organizations and programs at federal, state and local levels. Constitutional, statutory and administrative bases for organizing and conducting public and community health programs will be discussed.

CHP 669. Practicum. 3 or 6 credits. Field experience. The student is provided an opportunity to apply academic philosophy, theory, and principle during a period of supervised practice.

CHP 690. MSCH Comprehensive Examination. The Master of Science in Community Health Comprehensive Examination offers the student an opportunity to synthesize the learning experience of the graduate program and demonstrate mastery of program outcomes. The student must receive a grade of pass on the comprehensive exam to successfully complete the MSCH degree.

CHP 695. Topics in Community Health. 1-3 credits. Prerequisite: permission of the instructor. This course provides the opportunity for the study of selected topics in community health, under the supervision of a faculty member.

CHP 696. Special Topics in Allied Health. 3 credits.

CHP 697. Readings in Community Health. 1-3 credits. Prerequisite: permission of the instructor. This course provides an opportunity for advanced investigations of selected issues/concerns/trends in community health, under the supervision of a faculty member. It may be taken by students who wish to pursue topics not covered by regularly scheduled courses.

CHP 698. Thesis Research. 3-6 credits.

CHP 711. Health Care Research. Lecture 3 hours; 3 credits. This course is a conceptual approach to selection and application of univariate, bivariate and multivariate statistical techniques in health research data analysis. Emphasis is placed on handling large data sets and the use of a computer for manipulation of quantitative data.

CHP 715. Decision Analysis in Health Care. Lecture 3 hours; 3 credits. This course is a conceptual approach and teaches students the art and science of decision making. It covers expected utility theory, decision tree analysis, cost benefit analysis, and the psychological aspects of the decision-making process in the context of health policy research. (cross listed with HLSC 815)

CHP 720. Health Care Delivery Systems. Lecture 3 hours; 3 credits. This course provides the student with an opportunity to analyze the American health-care system. Like any other system in our society, the health care system is composed of complex organizational dynamics and structures which predicate the interaction between the major components of the system:

personnel who provide service; institutions in which care is provided; financing mechanisms that pay for care; and the government which attempts to regulate it. This course is designed for in-depth analysis and synthesis of all aspects of health care delivery with an emphasis on improving the delivery and access to care.

CHP 724. Performance Improvement in Health Care. Lecture 3 hours; 3 credits. Examination of contemporary and traditional concepts, tools, and approaches for analysis, improvement, and design of processes and their application in health care and public health organizations.

CHP 728. System Dynamics in Health Care Management. Lecture 3 hours; 3 credits. This course provides both a conceptual and experiential approach to understanding systems thinking and systems dynamics, especially as they relate to community and public health. The course presents a brief theoretical foundation in general systems theory and ties the concepts to organizational learning, organizational dynamics, and quality.

CHP 750. Educational Processes for the Health Professional. Lecture 3 hours; 3 credits. The teaching/learning process is the focus of this course for application to the many teaching roles which the health professional faces. The course is designed to meet the needs of the health professional in the areas of patient instruction, educational programs, and continuing education. The course is designed to assist students in identifying and gaining proficiency in the application of a variety of skills utilized by the health professional in designing, organizing, coordinating and evaluating health-education programs.

CHP 764. Health Economics. Lecture 3 hours; 3 credits. This course describes the application of economic tools to analyze the operation of markets for health care and insurance. Topics covered include the consumption and costs of health care in the United States, the viewpoints of players in the health care market, and an overview of both supply and demand analysis and cost effectiveness analysis. Complexities of economics unique to health care will be detailed. Further, students will employ these principles in several case studies of current and classic issues in health economics. (Cross-listed with HLSC 764)

CHP 772. Policy and Politics of Health. Lecture 3 hours; 3 credits. This course enables the student to develop systematic and analytical frameworks for understanding health and health-care policy issues. This course is designed to generate questions concerning practical issues in policy identification, development and evaluation as they relate to health-care management. The course will introduce the student to the policy process, background research necessary for policy implementation, and implementation strategies.

CHP 773. Development of Grants and Contracts in the Health Professions. Lecture 3 hours; 3 credits. This course will introduce the student to the issues and problems concerned with the development of grants and contracts as they relate to the health professions. Students will be given the opportunity to explore the multiple sources of grants and contracts as well as the difficulties in obtaining grants and contracts in this area. The course will focus on the multiple roles of the funding agencies and the importance

of matching the interests of the grant seeker with a corresponding funding agency.

CHP 775. Comprehensive Health Planning. Lecture 3 hours; 3 credits. This course emphasizes the principles and processes of program planning, including a consideration of objectives, priorities, policy choices, assessment of resources, implementation, and evaluation. The student will gain practical experience in program development by developing a planning document in this course.

CHP 787. Legal Aspects of Health Services. Lecture 3 hours; 3 credits. This introductory course will provide the student with information concerning the legal requirements affecting the health-care industry and is designed for all health professionals interested in the legal system's relationship to health-care delivery. Additionally, this course will provide a survey of the basic concepts and content in the major areas of health law, an explanation and identification of sources of legal authority, and a familiarity with legal language.

CHP 999. Community Health 999. A one-hour audit registration required of all graduate students to maintain active status during the final semester prior to graduation, if they are not formally enrolled in course work and have not completed all academic requirements for the degree. (See the policy on Graduate Student Registration Requirement for additional information.)

Dental Hygiene — DNTH

DNTH 412/512. Contemporary Roles for the Dental Hygienist. Lecture 3 hours; 3 credits. Prerequisites: DNTH 410 and 411, or permission of the instructor. Designed to enhance the students' scope of knowledge of contemporary dental hygiene interventions and best practice standards, encompassing the roles of a dental hygienist as clinician, administrator, consumer health advocate, educator, and researcher, with public health as an integral component in all these roles. Students will assess their personal strengths and interests to determine how and in what capacity they would best contribute as a member of an interdisciplinary oral health care team. (qualifies as a CAP experience)

DNTH 414/514. Educational Concepts for the Health Professional I. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Explores principles, theories and methods of teaching and learning intended to meet the needs of health care professionals in practice, educational settings, community health organizations, and health care facilities. Emphasis is on instructional strategies, planning, implementing and evaluating instruction.

DNTH 415/515. Research Methods in the Health Sciences. Lecture 3 hours; 3 credits. Prerequisite: STAT 130M. Designed to develop skills in scientific methods and critical analysis of research findings. Emphasis on types of research, problem selection and hypothesis writing, research planning and design, data collection and measuring techniques, analysis and interpretation of data, research proposal writing and computer application. A written research proposal is required for graduate credit. (offered fall)

DNTH 416/516. Administrative Leadership and Professional Development. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. A study of current trends that influence the profession of dental hygiene including oral health care delivery, manpower, financing mechanisms, quality improvement, third

party payers, professional associations, regulatory agencies and legislation. Emphasis is on ethical, political, and legal issues as they relate to the dental hygiene profession. (offered spring)

DNTH 497/597. Independent Study in Dental Hygiene. 1-6 credits. Prerequisite: permission of instructor. Independent reading and study on a topic selected under direction of a faculty member.

DNTH 602. Problems in Dental Hygiene. Lecture 3 hours; 3 credits. Prerequisite: DNTH 415/515. Independent study course required for those students in the nonthesis option. Student must execute a modest research or graduate project and complete and defend a written report. A comprehensive review of the literature is strongly recommended to fulfill this requirement. A written project proposal must be submitted and approved prior to beginning the project. Available for pass/fail grade only. (offered fall, spring, summer)

DNTH 604. Clinical Administration and Teaching. Seminar 3 hours; clinical teaching practicum 2 hours; 4 credits. Application of principles and theories of education and management to dental hygiene clinical education. Emphasis is on planning, implementing and evaluating clinical teaching; assessment of clinical competence; management of human and physical resources; and regulations affecting clinical education. (offered fall)

DNTH 660. Educational Concepts for the Health Professional II. Seminar 3 hour; 3 credits. Prerequisite: DNTH 414/514 or by permission of the instructor. Explores instructional strategies and their application to contemporary health professional roles. Emphasis is on individuals as health care specialists in business and industry; professional, private and public organizations; higher education; and the health care industry. Topics include implementation and evaluation of instruction, roles and responsibilities of faculty within an accredited program affected by state and national standards, and ethical and career related issues and trends. Students are provided with practical experience in traditional and distance education instructional methods. (offered Spring)

DNTH 668. Internship. 3, 6, or 9 credits. Prerequisites: DNTH 414/514, DNTH 415/515 and permission of the instructor. Experience-based learning activities designed to develop a role of competence related to the individual's area of specialization while working under the supervision of a faculty member or host supervisor within an educational, health care, research, or corporate health setting. A clinical dental hygiene internship is prerequisite to DNTH 669. Available for pass/fail grade only. (offered fall, spring, summer)

DNTH 669. Practicum in Clinical Management. Seminar 1 hour; clinic 6 hours; 3 credits. Prerequisites: DNTH 668, 604 and permission of the instructor. Selected clinical responsibilities assigned to prepare the individual to function effectively as an organizational manager. Projects individually designed to promote growth in leadership and administrative roles in oral health care. (offered fall, spring, summer)

DNTH 695. Topics in Dental Hygiene. 1-6 credits. Advanced seminars on selected topics in dental hygiene. Topics vary by semester. (offered fall, spring, summer)

DNTH 697. Independent Study in Dental Hygiene. 1-6 credits. Independent reading and

study on a topic selected under direction of a faculty member. (offered fall, spring, summer)

DNTH 698. Research. 3 credits. Prerequisite: DNTH 415/515. An original thesis research project is executed with the major advisor and thesis committee guiding the student's research project under supervision. A written research proposal must be submitted and approved prior to beginning the project. Required for students in the thesis option. Available as pass/fail grade only. (offered fall, spring, summer)

DNTH 699. Thesis. 3 credits. Prerequisite: DNTH 698. Devoted to research, writing of the thesis, and scheduled conferences with the candidate's advisor and thesis committee. Students must submit an acceptable written thesis demonstrating knowledge of problem selection, data classification, analysis and interpretation and defend it. Available as pass/fail grade only. (offered fall, spring)

Environmental Health — ENVH

ENVH 401/501. Occupational Health. Lecture 3 hours; 3 credits. Prerequisite: junior standing. An introduction to the industrial environment relative to health problems and the etiologically related agents.

ENVH 402W/502. Environmental Health Administration and Law. Lecture 3 hours; 3 credits. Prerequisite: junior standing. A review of the concepts and practice of administering environmental health control programs within agencies at the federal, state and local levels. The principles of administration and leadership of programs in the private sector are also discussed. The constitutional, statutory and administrative law bases for organizing and conducting such programs and developing environmental policy as well as the legal implications of enforcement will be addressed. A review of all major environmental statutes and their agencies that enforce them will be addressed.

ENVH 403/404. Environmental Health Internship I, II. 3 credits each; both required. Prerequisites: ENVH 301W and permission of program director. Includes placement in a health-related facility or industrial setting, prearranged with faculty instructor. (qualifies as a CAP experience)

ENVH 406/506. Principles of Occupational Safety and Health. Lecture 3 hours; 3 credits. Prerequisite: junior standing. A broad overview of the field of safety. A study of the factors influencing the occurrence of accidents and incidents is set in the context of safety legislation, current issues in the practice of safety and the ethical and professional responsibilities of the safety practitioner. The course also includes discussions of product safety, fire prevention and protection systems safety and human elements in loss prevention.

ENVH 407/507. Occupational Safety Standards, Laws and Regulations. Lecture 3 hours; 3 credits. Prerequisite: junior standing. A review of the important Occupational Safety and Health Standards and Codes with particular emphasis on application of these codes to typical work situations. Governmental enforcement methodologies are also discussed.

ENVH 420/520. Communicable Diseases and Their Control. Lecture 3 hours; 3 credits. Prerequisite: junior standing. An in-depth study of the communicable disease processes as they pertain to environmental sources. A detailed discussion of specific communicable diseases that

are manifested by various environmental etiologic agents. Various environmental control measures to prevent the incidence of communicable diseases are presented.

ENVH 421/521. Food Safety. Lecture 3 hours; 3 credits. Prerequisite: junior standing. A comprehensive study of food and milk production, processing and preservation and controls exercised for the prevention of foodborne illnesses and spoilage.

ENVH 422/522. Water and Wastewater Technology. Lecture 3 hours; 3 credits. Prerequisite: junior standing. Introduction to water quality management and wastewater treatment technology. Topics include the effect of organic, inorganic and thermal pollutants in water quality streams, waterborne diseases, monitoring concepts, methods of water quality management, regulatory considerations, theory and application of wastewater treatment concepts, wastewater characterization, and treatment methods and disposal methods.

ENVH 423/523. Vector Control. Lecture 3 hours; 3 credits. Prerequisite: junior standing. A study of the vectors of human disease and the methods utilized in their control. (offered spring)

ENVH 424/524. Residential and Institutional Environments. Lecture 3 hours; 3 credits. Prerequisite: junior standing. A study of the physical aspects of housing and institutions as they relate to human health and well-being. Coverage is also given to infection control in health-care facilities.

ENVH 425/525. Occupational Safety and Health Program Management. Lecture 3 hours; 3 credits. Prerequisite: junior standing. The establishment, implementation and maintenance of occupational safety and health programs. Paradigms of safety, techniques for safety training and creation of value for safety among business managers and employees are emphasized.

ENVH 426/526. Physical Hazards and Their Control. Lecture 3 hours; 3 credits. Prerequisite: junior standing. An in-depth examination of the varied types of physical hazards in the work environment and the methods of prevention, recognition and control.

ENVH 440/540. Principles of Ergonomics. Lecture 3 hours; 3 credits. Prerequisite: junior standing. An introduction to the terminology, concepts and applications of physiology, anthropometry, biomechanics and engineering to workplace and work methods design. Emphasis will be given to workplace design and work methods for job safety and health.

ENVH 441/541. Industrial Hygiene. Lecture 3 hours; 3 credits. Prerequisite: junior standing. An in-depth study of the chemical and physical agents responsible for occupational illness and the methods used for their measurement, evaluation and control.

ENVH 442/542. Sampling and Analysis Laboratory. Laboratory 4 hours; 2 credits. Prerequisite: ENVH 441/541 or permission of the instructor. Use and application of sampling and analytical equipment for measurement of chemical agents in the environment. Includes collecting media selection, sampling strategy, sample preparation and analysis.

ENVH 443/543. Principles of Toxicology. Lecture 3 hours; 3 credits. Prerequisite: junior standing and BIOL 190. An introduction to the fundamentals of toxicology with emphasis on the interaction of environmental and industrial chemicals with humans are studied. Exposure, dose response, kinetics and distribution of

toxics, metabolism of toxic agents, factors that affect toxicity and introductory chemical carcinogenesis are discussed.

ENVH 445/545. Air Pollution and Its Control. Lecture 3 hours; 3 credits. Prerequisite: junior standing. The study of air pollution in relation to air quality criteria, pollutant production, atmospheric evolution, measurement and control techniques.

ENVH 446/546. Physical Hazards Laboratory. Laboratory 4 hours; 2 credits. Prerequisite: ENVH 441/541 or permission of the instructor. Use and application of sampling methods and equipment for measurement of physical hazards in the work environment. Includes aspects such as ergonomics, noise, vibration and radiation.

ENVH 448/548. Epidemiology and Biostatistics. Lecture 3 hours; 3 credits. Prerequisite: junior standing. An introductory course in the principles and practices of epidemiology and the application of statistical and mathematical design and analysis of health research studies for the understanding and control of population health and disease with emphasis on environmental applications.

ENVH 461/561. Hazardous Waste Management. Lecture 3 hours; 3 credits. Prerequisite: junior standing. Description of the hazardous waste problem, the fundamentals of the chemistry involved with hazardous waste transport, methods of identification, assessment, control, and disposal of toxic and hazardous waste are discussed. In addition the relevant legal statutes, risk assessment emergency response and case studies are presented. Introduction to the toxicological effects of exposure to hazardous waste is discussed.

ENVH 465/565. Hazardous Materials Management. Lecture 3 hours; 3 credits. Prerequisite: junior standing. The management of hazardous materials includes a wide array of interlocking regulations addressing use, manufacturing, exposure, storage, shipping and disposal. A life cycle review of hazardous materials highlighting best practices and legislation is presented. Useful in preparation for CHMM examination.

ENVH 466/566. Environmental Risk Assessment and Decision Analysis. Lecture 3 hours; 3 credits. Prerequisite: junior standing. The principles of quantitative health risk assessment of toxicants are presented. Qualitative and quantitative skills necessary to evaluate the probability of injury, disease, or death in the general population from exposure to environmental contaminants are discussed. Hazardous identification, exposure assessment, dose-response evaluation and risk characterization are emphasized. Risk management group projects assessing some real environmental risks is an important segment of the class.

ENVH 470/570. Industrial Environmental Management. Lecture 3 hours; 3 credits. Prerequisite: junior standing. Course addresses day-to-day technical and management aspects of environmental compliance, as well as regulatory issues faced in industrial applications. Includes audits and inspections, air and water pollution and hazardous waste.

ENVH 495/595. Topics in Environmental Health. 1-3 credits. Prerequisite: junior standing.

ENVH 498/598. Independent Study in Environmental Health. 1-3 credits. Prerequisite: permission of the Program Director.

An opportunity is afforded students to undertake independent study under the direction of a faculty member.

ENVH 600. Principles of Environmental Health Science and Protection. Lecture 3 hours; 3 credits. An introduction to the chemical, physical and biological factors affecting human health and well being. The emphasis is on the application of controls to prevent disease and maximize environmental quality. (Cross-listed with CHP 602)

ENVH 602. Environmental Health Law and Policy. Lecture 3 hours; 3 credits. Prerequisites: MPH 610, 613. A review of the concepts and practice of administering environmental health control programs within agencies at the federal, state and local levels. The principles of administration and leadership of programs in the private sector are also discussed. The constitutional, statutory and administrative law bases for organizing and conducting such programs and developing environmental policy as well as the legal implications of enforcement will be addressed. A review of all major environmental statutes and their agencies that enforce them will be addressed.

ENVH 603. Environmental Epidemiology. Lecture 3 hours; 3 credits. Prerequisite: ENVH 448. Collection methods, analysis and interpretation of epidemiologic data with environmental and occupational disease emphasis.

ENVH 610. Food Microbiology. Lecture 3 hours; laboratory 3 hours; 4 credits. An in-depth examination of requirements for growth of food borne disease organisms. Includes hazard analysis and critical control point methodology.

ENVH 611. Water Pollution Control. Lecture 3 hours; laboratory 3 hours; 4 credits. A study of the chemical, physical and biological causes of surface and groundwater pollution. Emphasis is given to onsite wastewater systems and protection of groundwater supplies.

ENVH 621. Advanced Toxicology I. Lecture 3 hours; laboratory 3 hours; 4 credits. Prerequisite: ENVH 443/543. An in-depth study of the adverse interaction of environmental and occupational chemical agents with humans. Students critically review articles from the current toxicology literature with regard to scientific content, methods and conclusions. Each student presents at least two reviews during the semester.

ENVH 643. Principles of Toxicology. Lecture 3 hours; 3 credits. Prerequisites: MPH 610, 613. An introduction to the fundamentals of toxicology with emphasis on the interaction of environmental and industrial chemicals with humans are studied. Exposure, dose response, kinetics and distribution of toxicants, metabolism of toxic agents, factors that affect toxicity and introductory chemical carcinogenesis are discussed.

ENVH 722/822. Control of Hazards in the Workplace. Lecture 3 hours; 3 credits. Prerequisites: ENVH 441/541. Advanced methods for evaluation and control of hazards in the workplace.

ENVH 795/895. Topics in Environmental Health. Lecture 1-3 hours; 1-3 credits each semester. Prerequisite: permission of the instructor.

Health Sciences — HLSC

HLSC 701/801. Introduction to Health Services. Lecture 3 hours; 3 credits. Focuses on the complexities involved in providing health services to populations. Presents issues related to

public health, community health, urban and rural health, healthy people/communities and health care delivery in traditional and non-traditional settings.

HLSC 702/802. Management in Urban Health Services. Lecture 3 hours; 3 credits. This seminar will provide students with an understanding of health care organizations, effective management, and the urban context. Particular attention will be given to the issues of access, cost and quality.

HLSC 709/809. Multidisciplinary Approaches to Health Services Research. Lecture 3 hours; 3 credits. Uses theory and research findings from areas such as Biology, Psychology, Sociology, Economics, Urban Studies, and Health Services to achieve an understanding of health services issues and problems. Emphasizes methods of analysis and of developing alternatives related to multidisciplinary perspectives.

HLSC 710/810. Research Design and Application. Lecture 3 hours; 3 credits. Prerequisite: graduate-level courses in research design and statistics or permission of the instructor. Emphasis is on exploring the advantages/disadvantages and uses of non-experimental, quasi-experimental, and experimental designs in health-related research with application to management, education, and clinical practice. (cross-listed with PT 810)

HLSC 712/812. Qualitative Research Methods. Lecture 3 hours; 3 credits. An exploration of qualitative research methods including participant observation, ethnography and the generation of grounded theory. Individual interviews and focus group methods will be covered and historical, content analysis, phenomenological and montage approaches will also be discussed. Health related examples of published research in a variety of fields will be utilized to exemplify the methods.

HLSC 713/813. Measurement of Health Phenomena. Lecture 3 hours; 3 credits. Prerequisite: graduate-level courses in research design and statistics or permission of the instructor. An overview of measurement theory with emphasis on the development, testing, and refinement of norm- and criterion-referenced data collection instruments for health-related research.

HLSC 714/814. Theory in the Health Sciences. Lecture 3 hours; 3 credits. Introduces the philosophy of science by studying the nature and purposes of theory for the health sciences. Standards for evaluation of theories will be described. Selected theories and supporting research from the health services literature will be discussed and critically evaluated.

HLSC 730/830. Services for the Aging. Lecture 3 hours; 3 credits. A wide variety of services for older persons are examined. Each service will be studied from the following perspectives: 1) need, 2) assessment, 3) alternative intervention strategies, 4) concepts, and 5) public responses.

HLSC 731/831. Public Policy for the Aging. Lecture 3 hours; 3 credits. Public policy is defined broadly as what governments do and do not do. Policies concerning older persons will be examined primarily at the federal level. Emphasis will be on the of aging policy in this country, policy development process and the role of aging advocacy groups.

HLSC 764/864. Health Economics. Lecture 3 hours; 3 credits. This course describes the application of economic tools to analyze the

operation of markets for health care and insurance. Topics covered include the consumption and costs of health care in the United States, the viewpoints of players in the health care market, and an overview of both supply and demand analysis and cost effectiveness analysis. Complexities of economics unique to health care will be detailed. Further, students will employ these principles in several case studies of current and classic issues in health economics. (Cross-listed with CHP 764)

HLSC 772/872. Policy and Politics of Health. Lecture 3 hours; 3 credits. This course enables the student to develop a systematic and analytical frameworks for understanding health care policy issues. The policy process is covered in detail. Timely policy issues are also discussed.

HLSC 774/874. Administration in Health Services. Lecture 3 hours; 3 credits. Prerequisite: graduate-level course in management/administration. A study of resource management and organizational theory pertaining to the delivery of health care.

HLSC 776/876. International Health. Lecture 3 hours; 3 credits. This course will introduce the student to the political, social, cultural and ethical issues involved in disease prevention and health promotion in developing countries. Specific emphasis will be on incidence/prevalence, morbidity/mortality, and identified health problems in specific regions and countries. This course will also identify international health prerogatives aimed at improving health status through education and intervention.

HLSC 795/895. Topics in Health Services. 1-3 credits. Prerequisites: Ph.D. standing or permission of the graduate program director. Designed to provide the advanced student with an opportunity to study independently or in small groups and investigate specific topics of current interest in the health services.

HLSC 811. Health-Care Research Methodologies I. Lecture 3 hours; 3 credits. Prerequisite or corequisite: HLSC 710/810. This course is an applied approach to the selection and application of bivariate and multivariate statistical techniques in health services research. Emphasis is placed on handling large data sets and the use of a computer for manipulation of quantitative data.

HLSC 815. Decision Analysis in Health Care. Lecture 3 hours; 3 credits. This course teaches students the art and science of decision making. It covers expected utility theory, decision tree analysis, cost-benefit analysis, and the psychological aspects of the decision-making process in the context of health policy research.

HLSC 820. Health Care Delivery System. Lecture 3 hours; 3 credits. This course provides the student with an opportunity to analyze the American health care system. The health care system is composed of complex organizational dynamics and structures which predicate the interaction between the major components of the system: personnel who provide service; institutions in which care is provided; financing mechanisms which pay for care; and the government which attempts to regulate it. This course is designed for in-depth analysis and synthesis of all aspects of health care delivery with an emphasis on improving the delivery and access to care.

HLSC 868. Internship in Health Services. 3 credits. Available for pass/fail grading only. Health services field experience for students in

the Ph.D. in Health Services Research program. Supervised work experience in a health services agency. A completed research project which is publishable or presentable at a professional conference is required to complete the course.

HLSC 873. Development of Grants and Contracts in the Health Professions. Lecture 3 hours; 3 credits. Designed as a "hand-on" approach in effective grantsmanship, this course will guide the student from the identification of potential funding sources through proposal development. Highlights include program planning, nonprofit status, governmental/foundation corporate trends, local resources and grants administration.

HLSC 875. Comprehensive Health Planning. Lecture 3 hours; 3 credits. This course emphasizes the principles and processes of program planning, including a consideration of objectives, priorities, policy choices, assessment of resources, implementation, and evaluation. The student will gain practical experience in program development by developing a planning document.

HLSC 881. Dissertation Seminar. 3 credits. This course will assist students in developing a dissertation proposal. Steps in the research process will be reviewed as students submit drafts of their proposal for faculty and peer review. Problem formulation, integrating theoretical frameworks, preparing for human subjects review and outlining data analysis techniques for hypothesis testing will be discussed. Students will be introduced to University guidelines related to dissertations and other resources to assist them in their task.

HLSC 898. Research. 3 credits. Supervised research on a specialized topic.

HLSC 899. Dissertation. 1-12 credits. Available for pass/fail grading only. An approved research project written under the supervision of a faculty advisor, in which the student demonstrates the capacity to design and complete independent applied research. The completed project must be approved by the dissertation committee.

HLSC 999. Health Sciences 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Health Promotion and Education – HPRO

HPRO 650. Health Promotion and Education Methods and Materials. Lecture 3 hours; 3 credits. This course covers community health methods and strategies at the individual and community levels, teaching/learning styles, learning process, group dynamics, needs assessment, health literacy, adult learning principles, and teaching roles of the health professional. This course is designed to meet the needs of the health professional in the areas of patient instruction, educational programs, and continuing education.

HPRO 660. Program Planning and Evaluation. Lecture 3 hours; 3 credits. This course examines the application of evaluation skills for community health programs. The course is designed to assist students in identifying and gaining proficiency in the skills of designing, organizing, coordinating, and evaluating health education programs.

HPRO 670. Cultural Issues in Health Promotion and Education. Lecture 3 hours; 3 credits. This course provides an introduction for multicultural communication for health promotion and disease management. The topics include how to work collaboratively in diverse groups with an understanding of health behaviors, values, and health benefits.

Master of Public Health — MPH0

MPHO 610. Introduction to Public Health Practice. Lecture hours 3; 3 credits. This introductory readings course provides students with an overview of the public health sector from a local, national, and global perspective. The history of public health and recent events leading to a complete transformation of service delivery are two of the topics presented.

MPHO 611. Social and Behavioral Sciences for Public Health. Lecture hours 3; 3 credits. This course introduces those social and behavioral science concepts relevant to public health practice. Social and behavioral models that may influence population based health programs are emphasized with projects designed to demonstrate their use.

MPHO 612. Statistical Reasoning for Public Health. Lecture hours 3; 3 credits. This course introduces the application of quantitative reasoning in public health practice through the use of descriptive and inferential statistics. Students develop a project to demonstrate the application of statistical reasoning to population health concerns such as health disparities.

MPHO 613. Environmental Sciences for Public Health Practice. Lecture 3 hours; 3 credits. This course provides an introduction to the chemical, physical, and biological factors affecting human health and well-being. The application of controls to prevent disease and maximize environmental quality is emphasized.

MPHO 614. Epidemiology for Public Health Practice. Lecture 3 hours; 3 credits. This course provides an introduction to the methodology used to detect the incidence and prevalence of disease in populations. The basic principles of epidemiology are presented within an applied concept; projects emphasizing public health practice are assigned.

MPHO 615. Health Services Administration in Public Health. Lecture 3 hours; 3 credits. This course covers the application of management concepts to public health systems or settings that use a public health perspective in service delivery. Special emphasis is placed on experiential exercises that integrate management theory with public health practice.

MPHO 620. Aging and Health. Lecture 3 hours; 3 credits. This course addresses the aging process using an ecological model of health to examine the impact on individuals and society.

MPHO 630. Social Marketing for Health Populations. Lecture 3 hours; 3 credits. This course examines social marketing concepts and tools for influencing health behavior change. Students learn how to design, implement, and evaluate strategies for social marketing campaigns.

MPHO 633. Financing Healthcare. Lecture 3 hours; 3 credits. Students will examine financial evaluation of the health care industry, the source of funds, and the effects of changing patient policies. Other topics of interest will be financial strategies, budgets and capital outlay. Cross-listed with CHP 633.

MPHO 650. Global Health Issues. Lecture 3 hours; 3 credits. This course includes the political, social, cultural, and ethical issues for disease prevention and health promotion in developing countries. Students learn to identify international health prerogatives aimed at improving health status through education and intervention.

MPHO 656. Addiction Issues in Health Promotion Education. Lecture 3 hours; 3 credits. This course focuses on facts about drugs and drug abuse, on value judgments concerning drugs, and on interaction of facts and value judgments. The emphasis is on drug abuse prevention.

MPHO 660. Healthcare Informatics. Lecture 3 hours; 3 credits. This course examines the availability, use of interpretation of data obtained from traditional and new data systems used for population health monitoring. Included are public health surveillance systems, vital statistics, hospital discharge data, Health Plan Employer Data and Set (HEDIS), immunization information, school health data, 1996 Health Insurance Portability and Accountability Act (HIPAA), and regulatory agency data related to health.

MPHO 669. Public Health Practicum. 3 credits. This course provides students with an opportunity to engage in public health practice in the community or in a working environment. Students who have not work experience may want to consider the practicum as an elective course. Students currently employed in the public health sector may want to use the practicum as an elective to develop a work related project.

MPHO 672. Policy and Politics in Public Health. Lecture 3 hours; 3 credits. This course enables the student to develop systematic and analytical frameworks for understanding health and healthcare policy issues. The course will introduce the policy process, background research necessary for policy implementation, and implementation strategies. Cross-listed with HLSC 722.

MPHO 687. Legal Aspects of Health Services. Lecture 3 hours; 3 credits. This course provides information concerning the legal requirements affecting the health care industry. The course provides a survey of the basic concepts and content in the major areas of health law, an explanation and identification of sources of legal authority, and a familiarity with legal language.

MPHO 688. Grant Writing for Public Health Practice. Lecture 3 hours; 3 credits. This course covers issues and problems concerned with the development of grants and contracts as they relate to the health professions. The course focuses on the multiple roles of funding agencies and the importance of matching the interests of the grant seeker with the corresponding funding agency.

MPHO 691. Grant Writing for Public Health Practice. Lecture 3 hours; 3 credits. This course provides an introduction to grants and contracts useful on public health practice. Guidelines for funding development will be examined and students will write a grant. Those students with little or no experience in grant writing are encouraged to take this course as an elective or take the capstone for 3 credit hours thereby leaving room in the course of study for this course.

MPHO 689. Capstone Project. 3-6 credit hours. The Capstone Project must be taken as the

final course for the MPH degree. In this course a student works with a faculty preceptor and a community preceptor to produce a product useful to public health practice in environmental health (e.g. a paper, a manuscript, a grant, complete an internship, a work related project). The student must also complete a portfolio containing an activity log and relevant information gathered over the course of study to demonstrate the mastery of theoretical and applied concepts.

Medical Laboratory and Radiation Sciences — MLRS

MLRS 400/500. Principles of Molecular Pathology and Clinical Diagnostics. Lecture 3 hours; 3 credits. Prerequisites: BIOL 250, 251; CHEM 211, 212 or permission of instructor. Basic concepts of molecular pathology & clinical diagnostics including nucleic acids, DNA replication, transcription, proteins, mutations & chromosome changes that underlie inherited & acquired/infectious disease, inheritance patterns & genetics as applied to oncology, cardiac disease & organ transplants. Covers emerging molecular/cytologic/histologic methods (amplification, hybridization & microarrays) to detect disease markers, monitor therapy & assess identity; pharmacogenomics & legal/ethical issues of genetic testing.

MLRS 501. Molecular Diagnostics Laboratory. Lecture 3 hours; 3 credits. This course includes hands-on experience with or discussions of diagnostic instrumentation and assays using nucleic acid and protein extraction, gel electrophoresis, hybridization techniques, PCR and other amplification methods, DNA sequencing, autoradiography, microarrays, and proteomics-based methods.

MLRS 600. Advanced Clinical Applications of Molecular Diagnostics. Lecture 3 hours; 3 credits. This course will cover new applications of standard molecular diagnostic techniques and emerging technologies, instrumentation and technical advances, as applied to clinical case studies. Emphasis will be on pharmacogenomics and disease processes including inherited conditions, cancer, mitochondrial disorders, hematopathology, infectious diseases, and neuromuscular disorders.

MLRS 601. Advanced Molecular Diagnostics Laboratory. Lecture 1 hour, Laboratory 3 hours; 3 credits. Prerequisites: MLRS 500, 501, and 600. This course is a laboratory course that will emphasize the performance of advanced techniques needed to conduct molecular diagnostic or molecular biological procedures in a hospital-based clinical or research setting including RFLPs, DNA cycle sequencing and capillary electrophoresis.

MLRS 668. Clinical Laboratory Internship. 3 weeks full time; 3 credit hours. Prerequisite: MLRS 500, 501, 600, and 601. An optional three-week supervised rotation in a hospital-based molecular diagnostic clinical laboratory.

Medical Technology — MEDT

MEDT 403W/503. Management in the Clinical Setting. Lecture 3 hours; 3 credits. Prerequisite: junior standing. A course concerned with organization and management in the clinical setting including personnel supervision, planning, equipment justification, quality assurance, data processing, budgeting, fiscal techniques, marketing, regulatory agencies, educational methodologies, current issues, as well as legal and ethical considerations.

MEDT 440/540. Statistical Applications and Data Analysis in the Clinical Laboratory.

Lecture 3 hours; 3 credits. Prerequisite: STAT 130M. Topics include review of basic statistics used in the laboratory; use of statistics for quality control, reference range determination, method comparisons, test utility assessment, techniques for searching the literature and assessing quality and applicability of published studies; and data organization and retrieval via queries. Students will perform projects, preferably using actual laboratory data, that relate to lecture topics.

Nurse Anesthesia — NURA

NURA 650. Medical Physical Sciences. Lecture 3 hours; 3 credits. Prerequisite: admission to the program. Prepares the health care worker for a more advanced role on the health care team by providing an introduction to physics and biochemistry.

NURA 651. Pharmacology of Anesthesia Drugs. Lecture 4 hours; 4 credits. Prerequisite: NURA 650. Prepares the R.N. for a role on the anesthesia patient care team and in the administration of anesthesia by teaching analysis, synthesis, and evaluation skills in selecting and discussing appropriate anesthesia drugs for utilization in patient care situations.

NURA 652. Principles of Anesthesia Practice I. Lecture 4 hours; 4 credits. Prerequisite: NURA 650. Prepares the R.N. for a role on the anesthesia patient care team and in the administration of anesthesia by teaching a basic level of expertise in understanding and using anesthesia equipment in a competent and safe manner.

NURA 653. Principles of Anesthesia Practice II. Lecture 2 hours; 2 credits. Prerequisite: NURA 652. Prepares the R.N. for a role on the anesthesia patient care team and in the administration of anesthesia by teaching a basic level of cognitive, affective, and psychomotor expertise for the pre-operative, perioperative, and postoperative anesthesia periods.

NURA 654. Professional Aspects of Anesthesia. Lecture 3 hours; 3 credits. Prerequisite: admission to the program. A study of the unique goals, difference means, distinctive content, and special problems of health/anesthesia care and education in this country. Includes such areas as management, organization, legal aspects, professional adjustments, ethics, psychology, and history.

NURA 655. Principles of Anesthesia Practice III. Lecture 4 hours; 4 credits. Prerequisite: NURA 653. Continuation of role preparation in administration of anesthesia.

NURA 660. Pharmacotherapeutics for the Nurse Anesthetist. Lecture 3 hours; 3 credits. Prerequisite: admission to the program. This course is designed to expand the graduate nurse anesthetist student's understanding of pharmacological principles including pharmacokinetics and pharmacodynamics in the advanced practice role of nurse anesthesia.

NURA 694. Advanced Physical Assessment for Nurse Anesthetists. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisites: NURS 646, 647, NURA 652. Emphasis on physical assessment skills, interviewing skills, pathophysiological concepts, airway evaluation and management skills as related to anesthetic care plan and decision making.

NURA 754. Anesthesia Practicum. 4 credits. Prerequisite: NURA 652. Orientation to

the operating room and anesthesia. Additional selected clinical experiences.

NURA 755-756-757-758. Clinical Practicum A,B,C,D. 6 credits for 755. 10 credits for 756, 757, 758. Each course consists of orientation to the Operating Room and the Anesthesia Department. Prerequisite: admission to the program. Provides actual administration of general and regional anesthesia with qualified clinical instructors (Anesthesiologists and/or CRNA's). Weekly classroom sessions consist of clinical conferences; journal club; and seminars dealing with current topics, including, but not necessarily limited to, respiratory, cardiovascular, thoracic, neuro, regional, obstetrical, pediatric, and special areas of anesthesia. Various special projects and competency examinations are administered throughout this phase.

NURA 759. Advanced CRNA Clinical Course. 12 credits. Prerequisite: B.S.N. degree with CRNA license. This advanced placement credit is awarded to the certified registered nurse anesthetist who has demonstrated knowledge of selected complex nursing concepts for the provision of anesthesia services.

Nursing — NURS

NURS 495/595. Topics in Nursing. 1-3 credits. Prerequisite: Permission of the instructor. The study of selected topics that may not be offered regularly. Special topics will appear in the schedule of classes each semester.

NURS 610. Theoretical Foundations for Nursing Practice. Lecture 3 hours; 3 credits. This course focuses on development of advanced knowledge of nursing and non-nursing models, concepts, and theories as the supporting framework for professional nursing practice. Emphasis is placed on both analysis and application of the models, concepts, and theories to various client populations and nursing practice settings. Students are expected to support conclusions regarding a theory's utility to practice through presentation of supportive research findings.

NURS 611. Research Design. Lecture 3 hours; 3 credits. Builds upon the knowledge of the research process learned at the baccalaureate level. This course focuses on the development of research and scientific inquiry skills necessary for advanced practice. Emphasis is placed on investigation of research problems and the understanding of research design.

NURS 613. Issues in Advanced Nursing Practice. Lecture 3 hours; 3 credits. Prerequisites: NURS 610, 611. This course focuses on political, ethical, societal, and professional issues in advanced nursing practice. The student examines current and emerging advanced practice roles including entrepreneurship.

NURS 616. Organizational Leadership: Transformational Strategies in Focus Area. Clinical experience 8 hours; 2 credits. Prerequisite: admission to the program. This practicum is the first of a series of clinical courses that provide opportunities for advanced nursing practice in a variety of settings and with diverse clients. In addition, the student examines issues related to the advanced practice role in a chosen focus area. This course is designed to provide the student with experience in application of theories and assessment tools explored in Organizational Leadership.

NURS 617. Strategic Leadership: Transformational Strategies in Focus Area.

Clinical experience 8 hours; 2 credits. Prerequisite: NURS 616. This practicum course emphasizes the advanced practice nurse's role in strategic planning and program development. Students enrolled in this advanced practice course, the second of a series of three, will continue clinical practice experiences in a chosen focus area.

NURS 618. Visionary Leadership: Transformational Strategies in Focus Area. Clinical experience 8 hours; 2 credits. Prerequisite: NURS 617. This practicum course is the culminating course in a series of courses that target clinical experiences for the advanced practice nurse. The practicum emphasizes the advanced practice nurse's role in the implementation of change, meeting strategic initiatives, program evaluation, and outcome management in a chosen focus area. Application of futuristic and visionary theory to health care system trends is explored to provide optimal strategic positioning in future health care markets.

* **NURS 619. Advanced Nursing Practice IV.** Clinical 24 hours; 6 credits. Prerequisite: NURS 674, 675. This clinical course provides an opportunity for concentrated clinical practice in the advanced nursing practice role.

NURS 620. Professional Relationships and Human Resources Management. Lecture 3 hours; 3 credits. Prerequisite: admission to program or approval of instructor. This course focuses on the constructive use of power, influence and politics impacting nursing and the health care system. Theories of group dynamics, motivation and incentives will be used to underpin skill development in negotiation and conflict resolution.

NURS 634. Nurse Educator/Faculty Internship I Classroom Instruction. 2 credits. Corequisite: NURS 636. This practicum course is designed to provide the student with experience in classroom instruction. A nursing master teacher in an entry-level nursing education program mentors the student. Students consult with the role coordinator to select a site for the completion of this experience.

NURS 636. Instructional Delivery Methods in Nursing Education. Lecture 3 hours; 3 credits. Corequisite: NURS 634. The enhancement of nursing education through technology-based instruction utilizing a variety of resources and models is explored. Reports of best practices, research findings and learning-related theories to guide the development of media-supported instruction, skill acquisition in a simulated environment, and the creation and nurturing of learning communities in cyberspace are examined.

NURS 640. Research Methods. Lecture 3 hours; 3 credits. Prerequisite: NURS 611. This course focuses on development of skills in data analysis and implementation of various statistical methodologies. Tool development and technologies for presentation of data are explored.

NURS 642. Advanced Maternal Child Nursing II: Common Health Problems and Health Promotion of Children. Lecture 3 hours; 3 credits. This course provides knowledge and skills needed to promote and nurture the health of children from neonates to adolescents. The management of common health problems is also a focus.

NURS 644. Clinical Teaching Methods for the Nurse Educator. Lecture 2 hours; 2 credits. Corequisite: NURS 649. Prerequisite: NURS 634 and 636. This course describes practice settings

for nursing clinical instruction, identifies characteristics of effective clinical teachers, describes models and methods for clinical instruction that facilitate learning, and explores clinical evaluation methods and instruments.

NURS 645. Nursing Curriculum Design and Course Development. Lecture 3 hours; 3 credits. Corequisite: NURS 649. Prerequisites: NURS 634 and 636. Factors that influence the development of entry-level nursing curricula are explored in relation to workforce trends and accreditation standards and guidelines. The importance of a philosophical and theoretical foundation for nursing education is highlighted in relation to the development of a curricular framework that identifies instructional competencies and outcomes to guide course design and determine course content and sequencing.

NURS 646. Structure and Function for Advanced Nursing Practice I. Lecture 3 hours; 3 credits. Prerequisite: admission to the program. This course is designed to provide in-depth knowledge of structure and function of the human body as the necessary basis for the advanced practice of nursing. The course emphasizes analysis and application of the structure and function of the nervous, endocrine, and excretory systems to advanced practice nursing.

NURS 647. Structure and Function for Advanced Nursing Practice II. Lecture 3 hours; 3 credits. Prerequisite: NURS 646. This course is designed to provide in-depth knowledge of structure and function of the human body as the necessary basis for the advanced practice of nursing. The course emphasizes the analysis and application of the structure and function of the cardiovascular and respiratory systems to the advanced practice of nursing.

NURS 648. Disease Processes for Advanced Practice. Lecture 2 hours; 2 credits. Prerequisites: NURS 646 and 647. This course examines topics in selected disease processes. The course focuses on the significance of the disease for advanced nursing practice.

NURS 649. Nurse Educator/Faculty Internship II Clinical Instruction. 2 credits. Corequisites: NURS 644, 645. Prerequisites: NURS 634 and 636. This practicum course is designed to provide the student with field experience in clinical instruction. A nursing master teacher in an entry-level nursing education program mentors the student. Students consult with the role coordinator to select a site for the completion of this experience.

NURS 654. Assessment and Evaluation in Nursing Education. Lecture 3 hours; 3 credits. Corequisite: NURS 676. Prerequisites: NURS 634, 636, 644, 645, and 649. This course concentrates on strategies to measure and improve nursing student performance in the classroom, as well as enhance course and program effectiveness. Emphasis is on the selection of instruments, data collection methods and reporting procedures to guide assessment and evaluation processes that are appropriate for what is being examined.

* **NURS 658. Advanced Nursing Practice in Women's Health I.** Clinical experience 8 hours; 2 credits. Corequisites: NURS 663, 664, and 762. Prerequisites: NURS 661, 670, 671, 672, and 714. This course focuses on the development of advanced practice skills in the care of women.

* **NURS 659. Advanced Nursing Practice in Women's Health II.** Clinical experience 8 hours; 2 credits. Corequisite: NURS 787. Prerequisites:

NURS 658, 661, 663, 664, 670, 671, 672, 714, and 762. This course focuses on the development of advanced skills related to perinatal practice in the care of women.

* **NURS 660. Advanced Nursing Practice in Women's Health III.** Clinical experience 24 hours; 6 credits. Corequisite: NURS 686. Prerequisites: NURS 658, 659, 661, 663, 664, 670, 671, 672, 714, 762, and 787. This course focuses on the integration of advanced practice skills in the care of women including health promotion, illness management, reproductive needs, and lifespan care.

NURS 661. Pharmacotherapeutics for Primary Health Care Providers. Lecture 3 hours; 3 credits. Prerequisite: admission to the program. This course is designed to expand the graduate nurse practitioner student's understanding of pharmacological principles, including pharmacokinetics and pharmacodynamics.

NURS 663. Health Promotion and Maintenance. Lecture 2 hours; 2 credits. Corequisite: NURS 611. Prerequisites: NURS 610, 714. This course provides the nurse practitioner student the opportunity to incorporate strategies of risk analysis and reduction, screening, lifestyle change, and disease detection and prevention in family health care.

NURS 664. Primary Care for Women. Lecture 3 hours; 3 credits. Corequisite: NURS 663. Prerequisites: NURS 661, 670, 671, 672, and 714. This course will explore current clinical concepts related to the care of healthy and pregnant women. Roles and responsibilities of the family nurse practitioner in these subspecialties will be discussed.

* **NURS 665. Advanced Family Nursing I Practicum.** Clinical 8 hours; 2 credits. Prerequisites: NURS 661, 670, 671, 672, 714. Corequisites: NURS 663, 664, 762. This course provides the opportunity to practice clinical decision making and primary care assessment skills within a primary care setting. Collaborative strategies will be emphasized in the position of health promotion/maintenance strategies and the management of common health problems.

NURS 670. Advanced Pathophysiology. Lecture 3 hours; 3 credits. Corequisites: NURS 671 and 672. This course explains the pathophysiology of disease as a basis for advanced practice and assessment for prevention and management of health conditions.

NURS 671. Advanced Physical Assessment. Seminar 2 hours; 1 credit. Corequisites: NURS 670 and 672. Emphasis is on advanced history taking, physical assessment and interviewing skills for advanced practice nursing.

* **NURS 672. Advanced Physical Assessment Laboratory.** Laboratory 3 hours; 1 credit. Corequisites: NURS 670 and 671. This laboratory course provides the advanced practice student a hands-on opportunity to practice physical assessment skills needed by nurse practitioners.

* **NURS 674. Advanced Maternal Child Nursing Practice II.** Clinical 8 hours; 2 credits. Prerequisites: NURS 661, 670, 671, 672. Continued advanced practice nursing in the care of children and their families.

* **NURS 675. Advanced Maternal Child Nursing Practice III.** Clinical 8 hours; 2 credits. Corequisite: NURS 724. Prerequisite: NURS 674. Capstone clinical course in advanced practice nursing in the care of children and their families.

NURS 676. Professional, Ethical and Legal Concepts of Nursing Education. Lecture 3 hours; 3 credits. Corequisite: NURS 654. Prerequisites: NURS 634, 636, 644, 645 and 649.

This course examines the professional, ethical and legal responsibilities of nurse educators to create positive learning environments for students. Emphasis is on issues that may violate the collaborative partnership between faculty and student including due process, education malpractice, academic dishonesty, sexual harassment, and documentation of academic failure in the clinical setting or classroom.

NURS 686. Synthesis of Advanced Practice Concepts in Adolescent Focus. Lecture 3 hours; 3 credits. Prerequisite: NURS 661. This capstone course focuses on the synthesis of advanced practice concepts in the care of children. Content includes successful models of care and models of collaborative practice in pediatrics.

NURS 690. M.S.N. Comprehensive Examination. The Master of Science in Nursing comprehensive examination offers the student an opportunity to synthesize the learning experiences of the graduate program and demonstrate mastery of program outcomes in critical thinking, advocacy, leadership, advance practice, and education. The student must receive a grade of pass on the comprehensive examination to successfully complete the M.S.N. degree.

NURS 697. Topics: Independent Study. 1-3 credits.

NURS 698. Independent Clinical Study. 1-3 credits. Prerequisite: enrollment in the graduate nursing program and permission of the instructor. This course focuses on clinical and/or research-related competencies of graduate nursing students. Students enroll on an as-needed basis as determined by the instructor or student.

NURS 699. Thesis/Research Project. 1-3 credits. Prerequisites: NURS 611, 640. Thesis/research project completion. Variable credit to be determined by research advisor. May be repeated as needed.

NURS 705. Primary Care Approaches for Children. Lecture 3 hours; 3 credits. Corequisite: NURS 764. Prerequisites: NURS 661, 663, 664, 665, 670, 671, 672, and 762. This course for the family nurse practitioner focuses upon primary health care problems in the pediatric population. Emphasis is placed upon assessment and management of healthy and ill children.

NURS 714. Family and Community Focused Primary Care. Seminar 2 hours; 1 credit. Prerequisites: Admission in the FNP program. Corequisite: NURS 610. Focus is on assessing psycho-social problems in primary care setting. Student will develop skills in assessing the most common psychiatric disorders, substance abuse and disruptive behavior disorders. Assessment of the patient in the context of the family will be stressed.

NURS 724. Management of Chronic Problems and Illnesses. Lecture 3 hours; 3 credits. The focus on this course is on the management of chronic and acute illness in children.

NURS 730. Entrepreneurship for the Advanced Practice Nurse. Lecture 3 hours; 3 credits. This course is designed to acquaint the APN in the development of private practice. It incorporates the fundamentals of tax laws, overhead costs, benefit packages, billing and negotiation with third party payers and facilities.

NURS 732. Health Care Populations, Diversity and Outcomes. Lecture 3 hours; 3 credits. This course examines current topics and issues on health disparities of underserved populations, intervention and policy research using an interdisciplinary perspective including structural, financial, and personal barriers to healthcare and mediators that contribute to health disparities of underserved populations. Particular emphasis will be given to racial and ethnic issues. Students will design and test culturally appropriate interventions to address the most influential barriers that hinder the achievement of optimal health outcomes of underserved populations. Students will design evidence-based interventions based on current national mandates (Institute of Medicine [IOM], American Nurses Association [ANA], National Institutes of Health [NIH], US Department of Health and Human Services [USDHHS], *Health People 2010* goals, Joint Commission on Accreditation of Healthcare Organizations [JCAHO], and other agency related regulatory or subspecialty specific initiatives related to provision comprehensive and sensitive healthcare.)

NURS 735. Organizational Leadership. Lecture 3 hours; 3 credits. Prerequisite: Admission to program or approval of instructor. This course provides a theoretical foundation and focuses on leadership theory and assessment strategies for use in the health care system. Theories on leadership, organizations, policy, administration, and change will be applied to current health care system issues. Assessment tools for applications of theories will be utilized. Principles of organizational behavior and human resource management will be explored in the context of health care system needs.

NURS 740. Strategic Leadership. Lecture 3 hours; 3 credits. Prerequisites: admission to program, NURS 735, or approval of instructor. Corequisite: NURS 617. Principles of organizational strategy and program development are the major components for this course. Relevant theories associated with organizational development, setting program strategic initiatives, strategic planning, and organizational level analysis and evaluation will be explored.

NURS 745. Visionary Leadership. Lecture 3 hours; 3 credits. Prerequisites: NURS 735, 740, admission to program or approval of instructor. Corequisite: NURS 618. The final course in the leadership series provides the opportunity to examine outcomes at the program and health care system level and project future health care system needs. The focus is on activities necessary for effective evaluation of health care programs and meeting strategic initiatives by successfully implementing change. Capability for envisioning profound changes within the health care system will be developed. Transformation/Futuristic theory will be applied to envision market change for health care systems to be strategically positioned for future trends.

NURS 762. Advanced Family Nursing I: Management of Acute Illnesses. Lecture 3 hours; 3 credits. Corequisites: NURS 658 (for women's health nurse practitioner students), 663, 664, and 665 (for family nurse practitioner students). Prerequisites: NURS 661, 670, 671, 672, and 714. Focus is on acute health problems in the primary care setting, including assessment and management. Inclusion of geriatric content relating to acute illnesses will be added.

* **NURS 764. Advanced Family Nursing II Practicum.** Clinical 16 hours; 4 credits.

Prerequisites: NURS 661, 663, 664, 665, 670, 671, 672, 714, and 762. Corequisite: NURS 705. The purpose of this clinical course is to prepare the family nurse practitioner student to deliver primary care services to families in which a patient has either acute, women's health or pediatric care disorders.

NURS 765. Advanced Family Nursing II: Management of Chronic Illnesses. Lecture 3 hours; 3 credits. Corequisites: NURS 767 and 768. Prerequisites: NURS 661, 663, 664, 665, 661, 670, 671, 672, 705, 714, 762, and 764. The focus of this course is on the accurate diagnosis and management of chronic health problems within the primary care setting for the family nurse practitioner (FNP).

* **NURS 767. Advanced Family Nursing III Practicum.** Clinical 20 hours; 5 credits. Prerequisites: NURS 661, 663, 664, 665, 670, 671, 672, 705, 714, 762, and 764. Corequisites: NURS 765 and 768. This clinical emphasizes integration of primary care skills and clinical course decision-making in populations with acute chronic, complex, pediatric or women's health disorders for family nurse practitioner students.

NURS 768. Nursing Seminar in Complex Health Problems. Seminar 2 hours; 1 credit. Corequisites: NURS 765, 767. Prerequisites: NURS 613, 640, 705, 764. The focus of this seminar course is to explore clinical topics with an emphasis on the integration of primary care skills in advanced nursing practice.

NURS 780. Financial Issues in Nursing Administration. Lecture 3 hours; 3 credits. Corequisites: NURS 617 and 640. Prerequisites: NURS 616, 735. This course focuses on planning, designing, and monitoring of a nursing budget with special emphasis on personnel, supply, and capital equipment budgeting. Specific financial problems of a nursing service department are addressed.

NURS 787. Advanced Perinatal Nursing. Lecture 3 hours; 3 credits. Corequisite: NURS 659. Prerequisites: NURS 658, 661, 663, 664, 670, 671, 672, 714, and 762. This course focuses on the advanced nursing management of perinatal health for women.

NURS 795/895. Topics. Lecture 3 hours; 3 credits. Prerequisite: Ph.D standing or permission of the instructor. Designed to provide the advanced student with an opportunity to investigate specific topics of current interest in the health services.

NURS 800. DNP Integrative Concepts I. Lecture 3 hours; 3 credits. This course focuses on four DNP integrative concepts including leadership, advocacy, practice, and translational research. Issues related to planning and providing care for vulnerable and underserved populations will be highlighted.

NURS 801. DNP Integrative Concepts II. Lecture 3 hours; 3 credits. This course focuses on role expectations for doctorally prepared advanced practice nurses; the intersection of models of leadership, advocacy, practice and translational research will be emphasized.

NURS 802. The Business of Advanced Nursing Practice. Lecture 2 hours; 2 credits. Co-requisite: NURS 865. This course will explore the business dimensions of practice including legal, safety, quality and financial.

NURS 803. Leadership/Management in Healthcare. Lecture 3 hours; 3 credits. This

course explores organizational and structural opportunities and barriers within healthcare organizations. The focus is on the role of the advanced practice nurse as a leader and manager within healthcare organizations. Emphasis is on meeting the healthcare needs of underserved populations.

NURS 806. Practice-Based Research/Evaluation. Lecture 4 hours; 4 credits. Co-requisite: NURS 866. Prerequisites: NURS 800, 802. This research course is designed to provide the Advanced Practice Nurse with knowledge and skills regarding the design and methodology used to conduct a practice focused research study.

NURS 807. Informatics/Database Management. Lecture 3 hours; 3 credits. Co-requisite: NURS 867. Prerequisites: NURS 800, 801, 806. This research course is designed to provide the Advanced Practice Nurses with knowledge and skills regarding data analysis, the development of data codebooks, database development, data input, and utilization of large datasets for practice focused research studies with emphasis on vulnerable populations.

NURS 809. Health Care Planning and Policy for Advanced Practice. Lecture 3 hours; 3 credits. This course will prepare the DNP to assume a leadership role in developing, implementing, and advocating for health care policy that results in quality, accessible, comprehensive health care for vulnerable populations.

NURS 865. Clinical Residency for Advanced Practice I. Residency 4 hours; 1 credit. Co-requisite: NURS 802. This course is designed to provide the Advanced Practice Nurse with knowledge and skills to participate in clinical practice, collaborative teamwork, and practice-based evaluation.

NURS 866. Clinical Residency for Advanced Practice II. Residency 8 hours; 2 credits. Co-requisite: NURS 806. This course is designed to provide the Advanced Practice Nurse with the knowledge and skills to practice at an advanced level in a practice-based setting. Focus will be on evidence-based practice, teamwork, evidence-based research, and advanced clinical diagnostics.

NURS 867. Clinical Residency for Advanced Practice III. Residency 12 hours; 3 credits. Co-requisite: NURS 807. Prerequisites: NURS 800, 801, 802, 803, 806. This course is designed to provide the Advanced Practice Nurse with the knowledge and skills to practice as an expert clinician, a program evaluator, and a team leader within a practice-based setting focusing on evidence-based practice.

NURS 868. Clinical Residency for Advanced Practice IV. Residency 12 hours; 3 credits. Co-requisite: NURS 890. Prerequisites: NURS 800, 801, 802, 803, 806, 807. This course is designed to provide the Advanced Practice Nurse with the knowledge and skills to practice as an expert clinician, a program evaluator, a team leader, and a change agent with emphasis on translational and evidence-based research.

NURS 890. DNP Capstone. Lecture 3 hours; 3 credits. Co-requisite: NURS 868. This research course is designed to facilitate the ability of the Advanced Practice Nurse to synthesize, translate into practice, and disseminate practice focused research findings and apply findings to practice settings.

Physical Therapy — PT

PT 621. Introduction to Physical Therapy. Lecture 2 hours; 2 credits. Students will be exposed to basic medical terminology, patient management skills involving draping, positioning, transfers, and gait training with assistive devices.

PT 627. Theory and Practice I. Lecture 3 hours; laboratory 3 hours; 4 credits. Several instructional units introduce the student to the basic areas of physical therapy. Units include orientation to the profession, basic safety procedures, physical modalities of heat and cold, electrotherapy, bandaging and sterile technique, and massage.

PT 628. Theory and Practice II. Lecture 3 hours; laboratory 3 hours; 4 credits. Instructional units in this course include introduction of therapeutic exercise approaches for patient types with differing diagnoses. Through critical thinking and problem solving, students learn how to design specific exercise approaches based upon the goals developed for various diagnostic groups. They also learn how to assess the effectiveness, success, and potential risks associated with exercise and develop strategies to modify the treatments based upon those factors.

PT 630. Concepts in Histology for Physical Therapy. Lecture 1 hour; 1 credit. The emphasis in this course in histology is on connective tissue, muscle tissue, tissues of the nervous system as well as the skeletal system. The course is intended to give the physical therapy student a basic understanding of cell structure and function in these major systems. The course integrates with human anatomy and neuroscience.

PT 634. Clinical Sciences I. Lecture 3 hours; 3 credits. A series of lectures designed to acquaint the student with the clinical areas related to pathological conditions frequently seen in physical therapy practice. The course develops an understanding of the disease processes and guides the student in the application and analysis of pathology in the care of the patient.

PT 635. Clinical Sciences II. Lecture 3 hours; 3 credits. This course is designed to acquaint the student with medical aspects and pathological conditions associated with musculoskeletal and cardiopulmonary disease and disorders. Subunits also include presentations on cancer, hospice care, and hematological disorders.

PT 640. Patient Evaluation I. Lecture 2 hours; laboratory 2 hours; 3 credits. A beginning course in patient examination skills which focuses on documentation, vital signs and history/interviewing skills, Respiratory and cardiac examination, range of motion, surface anatomy palpation, reflex testing, and vascular status assessment are introduced.

PT 641. Patient Examination II. Lecture 2 hours; laboratory 2 hours; 3 credits. A continuation of the study of patient evaluation. The focus of this course is on the musculoskeletal respiratory and cardiovascular systems, and includes examination of posture and gait.

PT 655. Clinical Problem Solving I. 2 Credits. Lecture Hour and 4 Lab Hours. Corequisite: Student must be first year PT Students enrolled in the PT Curriculum. Use of case discussions, sample patients, and small group experiences to challenge student's abilities to apply information from class to actual patient problems.

PT 656. Clinical Problem Solving II. Field experiences 4 hours/week; 1 credit. Part-time

* Additional fee of \$250 required.

small group physical experiences in the local community physical therapy facilities.

PT 665. Biomechanics/Kinesiology I. Lecture 3 hours; 3 credits. This course will review the musculoskeletal system and normal movement. Students will be instructed in manual muscle testing techniques, as well as faulty patterns of muscle recruitment in substitution for various movements and activities.

PT 666. Biomechanics/Kinesiology II. Lecture 1 hour; laboratory 2 hours; 2 credits. Students will learn to assess the measurement of motion and forces in normal human movement. Trigonometry will be employed in the problem-solving section of the course as the student assesses forces, vectors and loads.

PT 669. Clinical Internship I. Field experience 40 hours/week; 8 weeks; 4 credits. This first full-time clinical education period begins at the end of the first academic year of the program and is designed to permit progressive responsibility in patient evaluation and treatment based upon material learned in classes during the first year. Each student is required to provide one in-service presentation during the clinical learning experience.

PT 695. Topics in Physical Therapy. Lecture 1-3 hours; 1-3 credits. Specially designed courses concerning specific clinical based topics relevant to physical therapy.

PT 792. Neuroscience I. Lecture 3 hours; 3 credits. Prerequisite: BIOL 889. Neuroscience I is the first in a series of courses that provide the student with an understanding of integrated neuroanatomy and neurophysiology. Emphasis will be placed upon basic neurophysiologic principles at the cellular level.

PT 793. Neuroscience II. Lecture 3 hours; 3 credits. Prerequisites: PT 792 and BIOL 889. Neuroscience II is the second course in the sequence. From the foundation of Neuroscience I, the course will build to the progressively higher order of structural functional relationships that control behavior.

PT 810. Scientific Inquiry I. Lecture 1 hour; seminar sessions 2 hours; 3 credits. This is the first in a series of courses that prepare the graduate to critically analyze and use scientific literature to improve clinical decision-making and practice. This course introduces the terminology and strategies of evidence-based practice applied to physical therapy. It emphasizes the basic concepts such as research design, measurement principles and basic statistics.

PT 822. Scientific Inquiry II. Lecture 2 hours; 2 credits. This course is a continuation of the graduate's preparation to practice critical analysis skills related to scientific literature. Its emphasis is placed on knowing the components of research reports and concepts associated with judging the quality and value of research. Students will apply this knowledge to answer clinical questions of diagnosis, prognosis, and intervention.

PT 826. Theory and Practice III. Lecture 2 hours; laboratory 4 hours; 4 credits. A continuation of the important aspects of physical therapy practice. This semester is made up of the following units: spinal cord injury, pediatric neurologic dysfunction, and adult neurologic dysfunction. The course focuses on treatment procedures including proprioceptive neuromuscular facilitation, current motor control and motor learning concepts, and neurodevelopmental treatment.

PT 827. Theory and Practice IV. Lecture 2 hours; laboratory 4 hours; 4 credits. This course covers advanced and special interest areas of practice such as joint mobilization, sports medicine, special testing equipment, mechanical traction application, and discharge planning for orthopaedic patients.

PT 836. Clinical Sciences III. Lecture 3 hours; 3 credits. This course continues with the presentation of pathologies and clinical manifestations of selected patient populations. Units within this course include pediatric, adult neurology, and spinal cord injury.

PT 837. Clinical Sciences IV. Lecture 3 hours; 3 credits. The continuation of a series in clinical areas. Emphasis areas in this course are on radiology, pharmacology, chronic pain, functional capacity evaluation and electrophysiological testing.

PT 842. Patient Evaluation III. Lecture 2 hours; laboratory 2 hours; 3 credits. This course covers the important evaluative elements associated with the neurological system, including evaluation of adult and pediatric patients with congenital or acquired conditions.

PT 857. Clinical Problem Solving III. Lecture 1 hour; Lab 4 hours. 2 credits. Student must be a second year PT student enrolled in PT curriculum. Use of case discussions, sample patients, and small group experiences to challenge student's abilities to apply information from class to actual patient problems. For this course, the emphasis is on Neurological and pediatric patients.

PT 858. Clinical Problem Solving IV. Lecture 2 hours; laboratory 4 hours; 2 credits. Student must be a second year PT student enrolled in PT curriculum. Use of case discussions, sample patients, and small group experiences to challenge student's abilities to apply information from class to actual patient problems. For this course, the emphasis is on orthopedic patients.

PT 865. Prosthetics and Orthotics. Lecture 3 hours; 3 credits. Prerequisites: PT 665 and 666. This course addresses the examination, assessment and fabrication issues associated with the development of prosthetics and orthotics for selected patient populations.

PT 871. Clinical Internship II. Field experience 40 hours/week; 8 weeks; 4 credits. The student is provided an opportunity to apply academic philosophy, theory, and practices during a period of clinical education. This internship or PT 872 will consist of a rehabilitation experience (pediatric or adult neurology). The student will be required to collect data for a research case study during this internship or PT 872.

PT 872. Clinical Internship III. Field experience 40 hours/week; 8 weeks; 4 credits. The student is provided an opportunity to apply academic philosophy, theory, and practices during a period of clinical education. This internship or PT 871 will consist of a rehabilitation experience (pediatric or adult neurology). The student will be required to collect data for a research case study during this internship or PT 871.

PT 873. Clinical Internship IV. Field experience 40 hours/week; 8 weeks; 4 credits. A fourth experience for physical therapy students. Students spend eight weeks at different facilities in a full-time internship. This course provides an opportunity to develop on-site innovative clinical investigations with program and clinical faculty coordination/supervision.

PT 874. Clinical Internship V. Field experience 40 hours/week; 8 weeks; 4 credits. A

final experience for physical therapy students. Students spend eight weeks at different facilities in a full-time internship. This course provides an opportunity to develop on-site innovative clinical investigations with program and clinical faculty coordination/supervision.

PT 880. Psychosocial Aspects of Patient Care. Lecture 2 hours; 2 credits. This course focuses upon the emotional and psychological elements associated with illness and disease. Students will learn the various societal and personal views of sickness and chronic illness as well as the coping mechanism employed by individuals and families when facing disease and terminal illness.

PT 881. Management of Special Populations. Lecture 2 hours; 2 credits. This course describes physical therapy management of challenges associated with selected groups of people. Effects of aging on gait and equilibrium will be discussed. Topics will include osteoporosis, breast and prostate cancer, sexuality, nutrition, the female athlete, the senior athlete, health care placement options, and social support in American society.

PT 882. Practice Management. Lecture 3 hours; 3 credits. This course is designed to provide the physical therapy student with a review of the principles and practices of managing and administering physical therapy in various clinical settings. The course stresses the principles of management administration in patient care in clinical environments.

PT 883. Professional Issues in Physical Therapy. Lecture/seminar 2 hours; 2 credits. This course is for the identification, analysis, and discussion of issues currently facing the physical therapy profession. The issues focus on the ethical questions as well as the role relationships of physical therapists in the greater health care delivery system of the United States.

PT 884. Clinical Teaching and Professional Communication. Lecture 3 hours; 3 credits. This course is designed to meet the needs for patient instruction, education within the classroom and clinic, and peer continuing education. The focus of the course is on clear communication in the teaching/learning process.

PT 890. Differential Diagnosis Seminar. Lecture 3 hours; 3 credits. Prerequisites: PT 634, 635, 836, and 837. The focus of this seminar is on the integration of the student's knowledge in the areas of the foundation and clinical sciences through the application of problem solving in differential diagnosis.

PT 891. Seminar in Integrative Case Studies. Lecture/seminar 3 hours; 3 credits. This course provides the faculty and students the forum to present clinical case studies. The students will have collected the data for their individual case presentations during the previous summer internships.

PT 892. Scientific Inquiry Seminar. Seminar 2 hours; 1 credit. This is the final course in the Scientific Inquiry series. The purpose is to apply the concepts of research methods and design in the framework of evidence-based practice to specific clinical problems. Students will appraise systematic reviews, guidelines, and the economics of health care in a seminar format.

PT 893. Topics in Clinical/Population/Community-Based Research. This is one of the 3 selective courses. This course addresses independent study research projects and gives the student and faculty opportunities to expand on

existing research in progress rather than just case studies.

PT 894. Topics in Advanced Practice Management. Lecture 2 hours; 2 credits. This is one of 3 selective courses to focus on advancing student's critical thinking and clinical decision-making skills from screening to outcomes assessment for various physical therapy diagnoses. Examples of topics would be

orthopedic or neurologic special tests for adults or pediatric patients.

PT 895. Topics in Physical Therapy. Lecture 1 hour; 1 credit. Specially designed courses concerning clinically based topics relevant to physical therapy practice.

PT 896. Topics in Professional Practice Expectations. This is one of 3 selective courses. This one may focus on cultural competence, clinical education, study abroad opportunities in

the Dominican Republic, professional development, or management.

PT 999. Physical Therapy 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

College of Sciences

www.sci.odu.edu/

Chris Platsoucas, Dean

Christopher Osgood, Associate Dean

Mike Overstreet, Associate Dean

Ph.D. Applied Experimental Psychology
Biomedical Sciences
Chemistry
Computational and Applied Mathematics
Computer Science
Ecological Sciences
Oceanography
Physics

Psy.D. Clinical Psychology

Master's Biology
Chemistry
Computational and Applied Mathematics
Computer Science
Ocean and Earth Science
Physics
Psychology

College of Sciences

143 Oceanography & Physics Building
Norfolk, VA 23529
757-683-3274

The College of Sciences' degree programs are designed to prepare students for careers in the sciences or to lay broad foundations for specialized training in these fields of knowledge.

The college is comprised of the Departments of Biological Sciences, Chemistry and Biochemistry, Computer Science, Mathematics and Statistics, Ocean, Earth and Atmospheric Sciences, Physics, and Psychology. The Departments of Biological Sciences, Chemistry and Biochemistry, Mathematics and Statistics, Ocean, Earth and Atmospheric Sciences, and Physics cooperate with the Darden College of Education to provide the necessary courses for a Masters of Science in Education in the respective field.

Programs

The College of Sciences has developed graduate programs in the basic and applied sciences that meet the needs of the Eastern Virginia region, the state, and the nation. These programs address a variety of challenges, ranging from basic research to the quest for solutions to contemporary problems in science. The importance of these challenges is reflected by the more than \$16 million in funded grants and contracts for educational and research endeavors currently generated by the college. The college provides the Mid-Atlantic States with much-needed graduate programs in broad fields of concentration leading to both master's and doctoral degrees. Related program emphases within the major areas of study are designed to meet the professional needs of the students and communities served.

The college's faculty of 160 highly skilled professional educators is devoted to guiding students toward an assimilation of the most current scientific theories, research, and practices.

College Financial Aid

The College of Sciences has established teaching and research assistantship stipends that range from \$5,250 to \$20,500. The responsibility for distributing these assistantship stipends lies in each department. In addition, each department has fellowship and tuition exemption funds available for competitive distribution.

Dominion Graduate Scholars

Programs in the College of Sciences offer a number of very competitive awards for graduate students newly admitted into Ph.D. programs. Some of these are Dominion Graduate Scholar appointments that carry a stipend of \$18,000 for a 12-month period and full tuition exemptions. These Scholars must be enrolled in at least six hours of graduate courses each semester, and three graduate credits during the summer to meet institutional eligibility requirements. These students are expected to be scholars in residence and spend full time in pursuit of their studies. Since the teaching or research experience will be more limited than for other awards, the Scholars will have sufficient time to devote to their academic studies.

All admission materials are considered as a part of the evaluation process. Students apply to specific graduate programs and may inquire about the Dominion Graduate Scholarship. After a student has been appointed to a Dominion Scholarship, the Graduate program director will submit a copy of their letter-of-offer, letter-of-acceptance and the awardee's credential summary.

Minimum criteria for eligibility are as follows:

1. GRE scores of either:
 1. 1200 combined verbal and quantitative, or
 2. 1300 in any two of verbal, quantitative, or analytical.
2. Undergraduate GPA of 3.20 overall and 3.50 in the major, out of 4.00 maximum.
3. Evidence of research aptitude by undergraduate thesis/research, publications, M.S. thesis and/or letters of reference.
4. Information concerning the Dominion Graduate Scholar Program may be obtained from the graduate program director for the program of interest.

Doctor of Philosophy - Biomedical Sciences

R. James Swanson, Graduate Program Director
R. James Swanson, Track Coordinator for Pure and Applied Biomedical Sciences
Nancy Xu, Track Coordinator for Biological Chemistry

The Departments of Biological Sciences and, Chemistry and Biochemistry at Old Dominion University and, as a consortium partner, the Departments of Pathology and Anatomy, Biochemistry, Pharmacology, Physiology, Microbiology and Immunology, Internal Medicine, Obstetrics and Gynecology, Pediatrics, Surgery, and Urology at Eastern Virginia Medical School offer course work and research opportunities leading to the Ph.D. degree in biomedical sciences.

In this interdisciplinary program all students are required to master a broad knowledge of the basic biomedical sciences. Integration of the basic courses is reinforced by a rotation of laboratory experiences and by special seminars that highlight disciplinary interrelationships and approaches to biomedical research. The student progresses from a core of basic courses to in-depth study of specific biomedical problems. This includes advanced doctoral courses and the doctoral research project. Under the guidance of the graduate faculty, the student will integrate knowledge from the broad spectrum of biomedical disciplines into his or her focus on an area of specialization.

The program graduate will be a scientist with a broad biomedical education and a demonstrated ability to carry out original and creative research, cognizant of the disciplinary interfaces and implications and capable of pursuing and/or recommending continuing lines of study. He/she will be prepared to bridge the gap between practice and discovery in the art of medicine and the practice of science. The graduate is capable of serving in an industrial, governmental, or academic teaching or research setting, either independently or as a member of a team.

Admission

The requirements for admission to the biomedical sciences Ph.D. program are as follows:

1. A bachelor's degree from an accredited college or university with a B (3.00) average. Students with advanced degrees are encouraged to apply.
2. Completion of the Graduate Record Examination (GRE); verbal + quantitative $\geq 1,000$.
3. Prior training in biology (two years), calculus and/or statistics, and organic chemistry (one year). Additional courses in biology, chemistry, and physics are recommended.

Virginia residency laws from the Code of Virginia apply to tuition charges and for other privileges accorded only to residents of Virginia.

Curriculum and Requirements

To accomplish the objectives of the program, the student:

1. Selects one of the approved tracks defining basic and advanced course work options;
2. Enrolls in the basic biomedical sciences courses to develop a broad foundation for more advanced course work and dissertation research;
3. Selects appropriate advanced course work approved by the guidance committee;
4. Completes at least 79 credit hours beyond the bachelor's degree or 48 credit hours beyond the master's degree;
5. Rotates through three laboratories (mentor's laboratory included as one) developing research questions and techniques in a variety of disciplines;
6. Presents two seminars;
7. Passes either (1) written and oral qualifying examinations on course work or (2) an NIH-style grant proposal written on a research question in an area not specific to the planned research in the mentor's laboratory and an oral exam on the grant proposal and on coursework;
8. Develops an interdisciplinary research proposal in NSF or NIH format that is accepted by the guidance committee;
9. Performs publishable research to demonstrate the ability to complete original and creative research projects; and
10. Prepares and successfully defends a dissertation.

The student's curriculum is designed with the assistance and approval of a guidance committee, following guidelines established by the track that most closely matches the student's interests. The two tracks approved within the biomedical sciences program at ODU are: biological chemistry, and pure and applied biomedical sciences.

The program of study in each track is divided into three phases:

Phase I (basic course work) introduces the student to much of the same basic science information as the medical student and provides the opportunity for applicants of different backgrounds to strengthen their training in preparation for the more advanced phases. Courses can be taken at Old Dominion University through the consortium at Eastern Virginia Medical School.

Phase II (specialization in an area of interest) enables students to develop depth of knowledge through intensive study in advanced course work and tutorials.

Phase III (research and dissertation) allows students to develop excellence in creative research in interdisciplinary problems in the Biomedical Sciences.

The program handbook describes in greater detail the development of the course sequences and the qualifying steps for progress through each of the phases leading to the award of the Ph.D. degree.

Application Procedures

The completed application for the biomedical sciences Ph.D. program will include the following items:

Transcripts of all college course work. Transcripts will be official transcripts sent by the registrars of the colleges attended.

1. Graduate Record Examination (GRE) test scores, sent directly from the Educational Testing Service to the Old Dominion University Graduate Admissions Office. The Medical College Admissions Test (MCAT) can substitute for the GRE (minimum score 26).
2. A statement of personal goals and academic objectives.
3. Three letters of recommendation (LOR), preferably from faculty members at colleges attended who are familiar with the applicant's academic and research capabilities.
4. A completed application form.
5. Receipt of the application fee. Checks should be made payable to Old Dominion University.
6. Test of English as a Foreign Language (TOEFL) test scores, sent directly from the ETS to ODU International Graduate Admission Office must accompany international applications unless the applicant holds a B.S. or M.S. from an American university.

Domestic student applications to Old Dominion University can be completed on-line. All official documents and LORs should be sent materials to the Office of Graduate Admissions, Old Dominion University, Norfolk, VA 23529-0050.

International student applications can be completed on-line. All official documents and LORs should be sent to Old Dominion University, Office of International Admissions, Old Dominion University, Norfolk, Virginia 23529-0050, USA. The initial application form can also be mailed for domestic and international students but certified copies of all test scores, letter of recommendation and transcripts must be sent directly to the university address listed above.

The applicant is responsible to ensure that all application materials are received and the application is complete in all respects.

Financial Aid

Sources of financial aid available to biomedical sciences Ph.D. students include (1) waivers of tuition, (2) research and teaching assistantships and (3) loans.

Department of Biological Sciences

110 Mills Godwin Building
Norfolk, Virginia 23529-0266
(757) 683-3595
<http://sci.odu.edu/biology/>

Wayne L. Hynes, Interim Chair
Deborah A. Waller, Assistant Chair
John R. Holsinger, Ecological Sciences Ph.D. Graduate Program Director
Robert E. Ratzlaff, Biology Master's Graduate Program Director
R. James Swanson, Biological Sciences Ph.D. Graduate Program Director

The Department of Biological Sciences provides a broad selection of course offerings. The degree program in biology allows for the selection of elective subjects most suited to the individual's vocational interests.

Master of Science—Biology

Robert E. Ratzlaff, Graduate Program Director

Students in the Master of Science program develop a curriculum centered on their particular interest such as: botany, ecology, immunobiology, infectious diseases, marine biology, microbiology, physiology, reproductive biology, systematic biology, and zoology. In addition, there are two specially designed concentration areas in biotechnology and wetland ecology. Students in these concentrations must satisfy all the requirements for the M.S. degree in Biology.

Facilities in the Department of Biological Sciences include: electron microscopes, terrestrial and aquatic animal care facilities; biomechanics,

environmental pollution, marine benthic ecology, bioinformatics, spectroscopy, cell culture, protein separation, DNA sequencing, GIS (Geographic Information System) and digital imaging, as well as a herbarium, zoological museum, and modern animal and greenhouse facilities. New aquatic and field science wet laboratories opened in 2009. In addition, excellent opportunities exist for research and instruction off-campus at Eastern Virginia Medical School, Frank Reidy Research Center for Bioelectrics and field research sites including: Blackwater Ecologic Preserve, Virginia Coast Reserve-Long Term Ecological Research Site, Virginia Institute of Marine Sciences Eastern Shore Marine Laboratory, and other regional agencies and facilities.

Admission Information

Students who wish to enter this program should apply to the Master of Science in biology program and indicate their proposed field of study in the Statement of Interest, a required component of the application. Applications for admission can be obtained via the Internet at <http://admissions.odu.edu/home.php> or from:

Office of Graduate Admissions
Old Dominion University
Norfolk, VA 23529-0050
(757) 683-3637

Requirements for regular admission to the master's program in biology are: (1) a bachelor's degree in biology or a related field from an accredited college or university; (2) a grade point average of 3.00 in biology subjects and at least 2.80 overall (on a 4.00 scale); (3) Graduate Record Examination scores of 1000 cumulative on the verbal and quantitative sections or Medical College Admission Test score of 24; (4) two letters of recommendation; (5) an essay describing professional goals and motivation for graduate study in biology; and (6) written acknowledgment from a Department of Biological Sciences faculty member agreeing to serve as the student's major advisor, if the student is accepted.

The Test of English as a Foreign Language is required of all applicants whose native language is not English.

Deadlines for application to the program are: February 1 for summer admission, early fall admission and consideration for a graduate teaching assistantship; June 1 for fall semester admission; and October 1 for spring semester admission.

Degree Requirements

Two degree options are available — thesis and non-thesis. A minimum of 31 semester hours of graduate credit is required of thesis students and 37 of non-thesis students; three-fifths of these credits must be at the 600-level or above and in structured courses. Research (BIOL 698) is required of all students. All students must deliver a scientific presentation in an appropriate public forum. For thesis students, the presentation should be at a scientific meeting. Course work, including any required courses, is selected according to the interest of the student, with the guidance and approval of the student's faculty advisory committee. All students will complete a comprehensive exam (written or oral) that covers the student's program of study. A substantial research project and a defense of the written thesis (BIOL 699) are required of students selecting the thesis option.

Master of Science - Wetland Biology Concentration

The wetland biology concentration has been structured to contain essential clusters in the following disciplines: plant identification, wetland and aquatic ecology, soils and hydrology, regulation, technical application, topical seminars, internships, and research and/or thesis. Required curriculum course are: BIOL 519, 543, 550, GEOL 508, and 622.

Master of Science - Biotechnology Concentration

The biotechnology program is designed to enable the student to learn basic skills in cell and molecular biology, with the flexibility to develop a curriculum in the areas of infectious diseases, immunology, physiology, or environmental molecular biology. The graduate program in biotechnology stresses the development of laboratory skills at the molecular and cellular level (which may be applied to the whole organism).

Biotechnology students are required to take four core courses in addition to the research and presentation requirements: Molecular and Immunological Techniques (BIOL 507), Cellular and Molecular Biology (BIOL 523), Biochemistry (CHEM 521/523), and Molecular Genetics (BIOL 755). The remaining coursework is selected according to the interest of the student, with the guidance and approval of the student's faculty advisory committee.

Master of Science in Education - Biology

Refer to the Darden College of Education section of this catalog.

Doctor of Philosophy - Ecological Sciences

John R. Holsinger, Graduate Program Director

Program Description

The primary goal of the doctoral program in ecological sciences is to provide advanced training in ecological, evolutionary and integrative biology. The program has notable strengths in a broad range of biological subdisciplines, including ecosystem studies, experimental ecology, population biology, conservation biology, systematics, evolutionary biology, and comparative and functional morphology. Program faculty conduct studies in a variety of terrestrial, freshwater, and marine environments on several continents, and their research focuses on a broad spectrum of taxa, including, but not limited to, vascular plants, polychaetes, mollusks, crustaceans, insects, fishes, amphibians, and reptiles. Many faculty combine active field research with parallel laboratory studies. Quantitative approaches are encouraged and the opportunity exists to obtain a master's degree in statistics while pursuing a doctorate in ecological sciences. The program is enhanced by excellent on-campus resources that include an electron microscopy lab, sequencing lab, herbarium, GIS facilities, greenhouse, and digital imaging facilities. Field research sites have been established in the Virginia Coastal Reserve, Blackwater Ecologic Preserve, Great Dismal Swamp, Atlantic Ocean, Chesapeake Bay, and other areas. A new facility for experimental aquatic research is under construction.

Admission

Application forms for admission to the Ph.D. program in ecological sciences are available from the Office of Admissions and online (<http://web.odu.edu/oduhome/admissions.shtml>). The following should be sent to the Admissions Office:

1. the completed application form;
2. official transcripts from all universities attended;
3. Graduate Record Examination (GRE) scores;
4. Test of English as a Foreign Language (TOEFL) score (from students whose native language is not English);
5. three letters of recommendation, including one from the applicant's major advisor; and,
6. a statement of professional goals that includes specific research interests.

The financial aid form, if applicant is requesting financial aid, should be sent to the Director, Ecological Sciences Ph.D. Program, Department of Biological Sciences, Old Dominion University, Norfolk, VA 23529-0266. Deadlines for application to the program are July 15 for the fall semester, November 1 for the spring semester, and April 15 for the summer term. Financial aid applications should be received by March 1 for the fall semester.

To qualify for admission, a student needs: (1) a satisfactory academic average (overall GPA score of at least 3.0 on a 4.0 scale), (2) overall GPA in the sciences of at least 3.0, (3) GRE scores near the 70th percentile on each of the examination sections: (verbal, quantitative, and analytical) with a combined total of 1,000 to 1,200 preferred on the verbal and quantitative), (4) a TOEFL score of at least 550 (for students whose native language is not English); and (5) satisfactory letters of recommendation and statement of professional goals as stated above. In addition, a master's degree is desirable but not required. The applicant is expected to have a background in the sciences, with an appropriate undergraduate degree and substantial course work in biology, chemistry or geology. While personal interviews are desirable, contact with a faculty member in the specific research area is required. This member must agree to be the major advisor, at least provisionally.

Program Requirements

Program requirements are designed to provide a firm foundation in conceptual elements of ecological, evolutionary, and integrative biology, while moving students expeditiously toward their own research. In general, students must complete 48 hours beyond the master's degree or, in the absence of a master's, 70 hours beyond the bachelor's degree. The student's program of study should be broad and balanced. Course work varies with each student, depending on background and goals. Enrollment in a weekly ecology seminar is required, on average, one semester each year. Professional experience (environmental management or teaching) is encouraged. A five-member advisory committee of faculty is selected to guide the student through his or her course of study. This committee also administers the comprehensive written and oral candidacy examinations, which are taken after all required course work is completed and the research skill requirement (proficiency on one foreign language or computer programming) is satisfied. The written exam

must be passed before the oral exam may be taken. Once the candidacy exams are completed and a dissertation committee of three faculty approves a written dissertation prospectus, the student advances to candidacy. At least three of the members of the original advisory committee, including the committee chair (student's major advisor), will compose the dissertation committee. This committee approves a written dissertation prospectus and will supervise the research. At this time, the student's attention turns almost exclusively to his or her own research. However, students continue to participate in seminar courses on a variety of topics, and an average of one seminar course per year of residency on campus is required. At the conclusion of their research, the student submits a dissertation to the committee and presents a public defense of this work.

Courses

Many graduate courses pertinent to the Ph.D. in Ecological Sciences can be applied toward the degree requirements. Such courses include, but are not limited to, the following:

BIOL 500	Vascular Plant Families	5
BIOL 501	Entomology	4
BIOL 504	Conservation Biology	5
BIOL 512	Plant Physiology	4
BIOL 515	Marine Ecology	3
BIOL 517	Limnology	3
BIOL 519	Wetland Delineating Plants	5
BIOL 520	Ichthyology	5
BIOL 521	Ornithology	3
BIOL 522	Field Studies in Ornithology	3
BIOL 528	Physiological Ecology of Animals	3
BIOL 531	Mammalogy	5
BIOL 533	Cave Biology	4
BIOL 538	Dendrology	4
BIOL 541	Animal Behavior	4
BIOL 542	Marine Ecology Lab	2
BIOL 543	Environmental Impact Assessment	3
BIOL 545	Community Ecology	3
BIOL 546	Comparative Biomechanics	3
BIOL 548	Population Ecology	3
BIOL 550	Principles of Plant Ecology	4
BIOL 573	Herpetology	5
BIOL 578	Microbial Ecology	3
BIOL 579	Microbial Ecology Lab	1
BIOL 632	Marine Microbiology	4
BIOL 807	Ecosystem Ecology	5
BIOL 808	Ecological Sciences Seminar	3
BIOL 820	Systematic Ichthyology	1
BIOL 828	Simulation Models: Ecosystem and Global Applications	5
BIOL 831	Systematics and Speciation	3
BIOL 849	Biogeography	3
BIOL 850	Marine Benthic Ecology	4
BIOL 852	Quantitative Ecology	4

Department of Chemistry and Biochemistry

110 Alfriend Chemistry Building
Norfolk, VA 23529-0126
(757) 683-4078
<http://sci.odu.edu/Chemistry/>

Richard Gregory, Chair
Craig Byrne, Graduate Program Director
Master of Science – Chemistry

The Department of Chemistry and Biochemistry offers a program of study leading to the degree of Master of Science in Chemistry. This program offers a sound academic background of coursework and research to prepare the student for further graduate study or employment in fields requiring an advanced degree. Areas of specialization within the program include: analytical chemistry, biochemistry, environmental chemistry, marine chemistry, materials chemistry, organic chemistry and physical chemistry.

Admission

An application (www.admissions.odu.edu), transcripts, two letters of recommendation from former college instructors, a resume, an essay about career goals and Graduate Record Examination (GRE) scores (aptitude section) are required for consideration of admission to the program. Admission to regular status requires a grade point average of 3.00 in the major and 2.80 overall (on a 4.00 scale). General university admission requirements also apply. In addition, a Bachelor of Science degree (or equivalent) with a major in chemistry (or another science) is required, although applications from majors in all science disciplines are encouraged. Undergraduate courses in organic chemistry, inorganic chemistry, analytical chemistry (quantitative and instrumental analysis), physical chemistry and calculus are required for regular admission. Deficiencies in any of these areas will be identified and must be rectified by taking undergraduate coursework.

Program Requirements

Writing Proficiency Policy: The departmental graduate committee will request a writing sample from each new student. If the graduate committee feels that remedial assistance in writing is needed, the student will be referred to the Writing Center.

Options: Candidates for the master's degree have two options in their program: the Research/Thesis option and the Non-Thesis option.

Courses: A minimum of 30 hours is required for the thesis option, including six hours for research and thesis. A minimum of 33 hours is required for the non-thesis option, including three hours for independent study. Up to 15 hours may be taken in related courses given by other departments provided they are approved by the Graduate Studies Committee of the Department of Chemistry and Biochemistry. At least 60 percent of the credit hours must be from 600-level courses or higher.

Core Courses: There are five core areas. These are analytical chemistry, biochemistry, environmental chemistry, organic chemistry and physical chemistry. Students enrolled in the research/thesis option must take one course from three different core areas; non-thesis option students must take one course from each of the core areas.

Seminar: All students are required to register for seminar CHEM 610 (one credit, pass/fail) and attend departmental seminars for one semester. Failure to attend at least 75 percent of the departmental seminars will result in a grade of incomplete (I) which must be converted to a passing grade by writing a literature research paper on the work of one of the seminar speakers. During their last semester, students are required to register for seminar class CHEM 611 (two credits, graded) and present a seminar on their research.

Research and Thesis: During their first semester (and not later than the end of their first academic year), students electing the Research/Thesis Option are required to interview the chemistry graduate faculty, choose a graduate faculty research advisor, and develop a research committee. Upon completion of their

research, students must write a formal thesis acceptable to their research committee and defend it to their research committee.

Non-Thesis Option: Not later than the end of their first academic year, students electing the Non-Thesis Option are required to interview the chemistry graduate faculty and choose a graduate faculty independent study advisor. Non-thesis students and their independent study advisor will then agree upon an independent study project. Upon completion of their independent study project, non-thesis students must write a formal Independent Study Report acceptable to their independent study advisor and the Graduate Studies Committee and pass an oral exam on their project.

Master of Science in Education - Chemistry Major

Refer to the Darden College of Education section of this catalog.

Doctor of Philosophy – Chemistry

The Ph.D. program in Chemistry prepares students in the application of chemical principles to address many of society's technical, environmental, and biomedical problems. Students will be able to provide leadership in industrial, governmental, and educational institutions in directing research and/or development to solve these problems. The Ph.D. degree in Chemistry is granted to students who have: (1) mastered advanced knowledge of definite sub-fields of chemistry; (2) become familiar with research in these specific fields and developed perceptions of opportunities for further scientific advances; and (3) demonstrated the capacity to perform original, independent, and scholarly scientific investigation in their specific field and interpret their results.

All students admitted to the program must read and understand the regulations and policies described here and elsewhere throughout this catalog relevant to Old Dominion University's requirements for Ph.D. degrees. The essential credit requirements for the Chemistry Ph.D. are: a minimum of 78 credit hours beyond the Bachelor's degree and 48 credit hours beyond the master's degree.

Admission

An application (www.admissions.odu.edu), transcripts, three letters of recommendation from former college instructors, an essay about career goals and Graduate Record Examination (GRE) scores (aptitude section) are required for consideration of admission to the program. Admission to regular status requires a grade point average of 3.00 in the major and 3.00 overall (based on a 4.00 scale). General university admission requirements apply. In addition, a bachelor's degree (or equivalent) with a major in chemistry (or another science) is required, although applications from majors in all science disciplines are encouraged. Undergraduate courses in inorganic chemistry, organic chemistry, analytical chemistry (quantitative and instrumental analysis), physical chemistry and calculus are required for regular admission. Deficiencies in any of these areas will be identified and must be rectified by taking undergraduate coursework in these areas.

Program Requirements

Writing Proficiency Policy: The departmental graduate committee will request a writing sample from each new student. If the graduate committee feels that remedial assistance in writing is needed, the student will be referred to the Writing Center.

Courses: A minimum of 78 semester hours beyond the undergraduate degree or 48 hours past the master's degree is required by this program. The broad requirements for granting the Ph.D. are as follows: satisfactory performance in core and elective courses, successful completion of both written and oral portions of the Candidacy Examination, completion of the dissertation prospectus, and completion of a satisfactory dissertation and defense of the dissertation.

Core Courses: Students must choose one course from three different core areas. The core areas are analytical chemistry, biochemistry, environmental chemistry, organic chemistry and physical chemistry. Classes from each area are listed on the following pages.

Elective Courses: Students are required to take nine credit hours of elective courses. The courses are to be chosen upon consultation with their advisor and/or their guidance committee.

Teaching: Students are required to spend at least one semester as a teaching assistant.

Seminar: All students are required to register for seminar CHEM 802 (one

credit, graded pass/fail) and attend departmental seminars throughout their graduate career. Failure to attend at least 75 percent of the departmental seminars will result in a grade of incomplete (I), which must be converted to a passing grade by writing a literature research paper on the work of one of the seminar speakers. Twice during their career, students will register for CHEM 803 (two credits) and present a seminar, which will receive a letter grade. In the second year, students will give a background literature talk on their research. They will give their second seminar on their dissertation research just before they graduate.

Research and Thesis: During their first semester (and not later than the end of their first semester), students are required to interview the chemistry graduate faculty (a signed sheet of at least three faculty members is required), choose a graduate faculty research advisor, and develop a guidance committee. The student must write a research proposal describing his/her proposed research project and present it after the candidacy examination has been passed. Upon completion of the research, the student must write a formal thesis acceptable to his/her dissertation committee and defend it.

Candidacy Examination: A student admitted to the Ph.D. program in chemistry becomes a candidate for the Ph.D. degree by passing the Ph.D. Candidacy Examination. This examination consists of a written portion and oral portion. The student is required to submit a written description of a novel research idea in the form of a grant proposal, and then present and defend the idea to his or her guidance committee.

Dissertation: The dissertation is the final and most important part of the work required for the Doctor of Philosophy degree in chemistry. The dissertation must be based on original research and make a contribution to existing knowledge of sufficient interest to warrant publication in a refereed journal. The candidate normally works closely with the research advisor, who is chair of the dissertation committee.

Dissertation Defense: The final examination of the candidate consists of the oral defense of the dissertation. This public examination is conducted by the dissertation committee with the research advisor serving as chair.

Department of Computer Science

Engineering & Computational Sciences Bldg,
4700 Elkhorn Ave, Suite 3300
Norfolk, VA 23529-0162
<http://www.cs.odu.edu/>

Desh Ranjan, Chair
Hussein Abdel-Wahab, Graduate Program Director

Programs

The Department of Computer Science offers programs leading to the Master of Science with a major in computer science, an accelerated five year combined B.S.C.S. and M.S. with a major in computer science and the Doctor of Philosophy in computer science. The Department of Computer Science also offers a Master of Science and Master of Engineering in computer engineering (jointly with the Department of Electrical and Computer Engineering in the Batten College of Engineering and Technology) and a Master of Science in computer science with a computer information sciences emphasis (jointly with the Information Technology Department in the College of Business and Public Administration).

Computer science traces its foundation to mathematics, logic and engineering. Studies in computer science encompass theory, experimental techniques, and engineering methodology. The computer science curriculum exposes students to aspects of each of these disciplines and fosters an appreciation and understanding of them. Students are exposed to the broad theoretical basis of computer science through lecture and laboratory experience.

The Computer Science Department has a unique curricular model that applies computer science education to the real world. In addition, the Computer Science Department offers a set of courses to professionals who need supplementary experience; these courses include database administration, network design and administration, and UNIX system administration.

A graduate of the computer science program will have a broad fundamental knowledge of the field and in-depth knowledge in a particular subject area. To acquire breadth, graduate students in the department are required to take core courses which together with the undergraduate core courses cover major

aspects of computers and computation. At the master's level, the department supports in-depth study in the following areas: networking, security, software engineering, computational foundations, database engineering, digital libraries, high performance scientific computing and bioinformatics. At the Ph.D. level, areas of specialization are limited only by the interests of the available faculty.

Computing Facilities

The department has over 750 high-end workstations running various flavors of the UNIX operating system and Microsoft operating system. All resources are connected via gigabit Ethernet and both the research and instructional facilities have access to wireless Ethernet connectivity. The department network is connected to the internet at 155MBPS. The department also has access to the National Lambda Rail allowing connection to select research institutes at 10GBPS. The department has two datacenters with over 75 servers running various research and instructional applications. Over 10 terabytes storage space is available within the department. The department has four clusters with 32 node dual opteron processors.

Admission

Students entering a graduate program in the Computer Science Department must have a bachelor's degree from an accredited college or university. In addition, an applicant must have a strong background in computer science. Students who do not have a sufficient background in computer science may enter the master's program as provisional students and make up for their deficiencies by taking appropriate courses. An applicant for the Ph.D. program is expected to have a master's degree in computer science or a related field. Applicants are required to take the GRE aptitude test; for the computer information sciences emphasis area (described below), the GMAT aptitude test may be used. Two letters of recommendation from faculty members of academic institutions are required in addition to all transcripts at the post-secondary level. For students whose native language is not English, a TOEFL score of 550 or higher is also required.

Each application for a graduate program is evaluated individually by the departmental graduate committee.

Master of Science - Computer Science

Requirements

The departmental requirements for the master's degree are described below. All these requirements must be satisfied in addition to the University requirements outlined under the Academic Information section of this Catalog.

Core courses: CS 550, 555, 600, and 665.

Colloquium: Attend at least 10 colloquiums as detailed below.

Comprehensive examination: Pass at least at the MS level as detailed below.

Course options: Two options are available for candidates for master's degrees: thesis option and non-thesis option.

Thesis Option. A minimum of 31 credit hours is required, including 24 credits of course work, six credits of thesis research and one credit of colloquium. The candidate is required to write a thesis and make an oral presentation of the results.

Non-thesis Option. A minimum of 34 credit hours is required, including 30 credits of course work, three credits of project work and one credit of colloquium. The candidate is required to prepare a written report on the project and to present it orally.

Course restrictions: No more than six credits of the following courses may be counted towards the degree: CS 697, CS 791 and CS 796. At least three credits counted toward the computer science degree must be taken at the 700-level from courses other than CS 791 and CS 796.

Time Limit. All requirements for the master's degree must be completed within six years.

Master of Science - Computer Information Systems Emphasis

Requirements

This area, offered jointly with the Information Systems and Technology Department of the College of Business and Public Administration, is appropriate for students with either a bachelor's degree in business administration with a major in information systems and a computer science minor or with a bachelor's degree in computer science with a business administration minor.

Core courses: CS 551 or IT 664, CS 554 or IT 665, CS 555, and IT 672. Two must be taken from each department.

Colloquium: Attend at least 10 colloquiums as detailed below.

Comprehensive examination: Pass at least at the M.S. level as detailed below.

Course options: Same as described above in the M.S. in computer science. At least three courses from each department are required.

Course restrictions: Same as described above in the M.S. in computer science.

Time Limit. All requirements for the master's degree must be completed within six years.

Accelerated B.S. and M.S. in Computer Science

This program allows for exceptionally successful students to earn both a B.S. and M.S. in Computer Science within five years by allowing them to count up to 12 credits of graduate coursework toward both their undergraduate and masters degrees in Computer Science.

Master's Degree - Computer Engineering Major

Entrance Requirements

An undergraduate degree in an Accrediting Board for Engineering and Technology (ABET)-accredited computer engineering program is an ideal preparation for the program, though students with degrees in either computer science or electrical engineering should be able to enter the program with very few deficiencies (typically no more than three courses) and are encouraged to apply.

Requirements

All students are required to take four core courses: CS 555, 665; ECE 544 and 642. Students must also take four electives from an approved list of computer science, electrical and computer engineering and mathematics courses with at least one selection from computer science and one selection from electrical and computer engineering. Each student must pass a written and/or oral comprehensive examination and a writing proficiency examination.

Master of Science

A minimum of 31 credits is required, including 24 credits of approved course work, six credits of research work, and one credit of colloquium. The candidate is required to prepare a thesis.

Master of Engineering

A minimum of 31 credits is required, including 30 credits of approved course work and one credit of colloquium.

Doctor of Philosophy - Computer Science

Requirements

A candidate for the doctoral degree in computer science must meet all of the following requirements in addition to the university requirements outlined under the Academic Information section in this Catalog:

1. Pass the diagnostic examination at the Ph.D. level;
2. Complete a minimum of 27 credit hours of course work beyond the master's degree (or equivalent);
3. Pass the candidacy examination;
4. Attend at least 20 colloquiums as detailed below;
5. Complete the dissertation work of 24 credit hours or more; and,
6. Successfully defend the dissertation.

The above must be completed within eight years after admission to the Ph.D. program.

Diagnostic Examination. Students who have been admitted to study toward the doctoral degree in computer science must pass the diagnostic examination at the Ph.D. level before the end of 12 hours of postmaster's course work or the end of their second semester, whichever comes first. See the details below.

Advisor. Upon admission to the Ph.D. program, a faculty advisor will be assigned to the student for general guidance. The student, however, is expected to have found a dissertation advisor by the time he or she passes the diagnostic examination.

Course Requirements. Students must complete the course work as specified below:

1. A minimum of 27 hours beyond the master's degree. At least 9 out of these 27 credit hours should be non-topics courses;
2. At least 18 hours must be from the 800 level;
3. At least 18 hours must be in computer science; and
4. A maximum of six hours may be transferred into the Ph.D. program from postmaster's course work done elsewhere.

Candidacy Examination. Near the end of the course work the student must pass a candidacy examination. This examination is designed to test the student's knowledge of computer science as well as background knowledge on the dissertation topic. The student is required to prepare a literature critique on the dissertation topic and a dissertation research proposal including a research

plan. The student must pass this examination no later than three years after acceptance into the Ph.D. program.

Dissertation. A minimum of 24 credit hours of dissertation work is required. The work must represent an achievement in research and must be a significant contribution in the field.

Publication. Students are required to publish (or have in a revision process) at least one paper in a refereed journal or refereed conference proceedings based on their dissertation work.

Dissertation Defense. The examination will be oral and the examination committee must have the completed dissertation at least two weeks before the examination date. In addition to the defense, students are required to give a public oral presentation on their dissertation results.

Time Requirement. Ph.D. students should normally be full time. Students who wish to pursue their study on a part-time basis must spend at least two semesters on campus or at an off-campus facility engaged in full-time graduate study. A full-time student can be expected to satisfy all the Ph.D. requirements in three years when entering with an M.S. degree in computer science or four years with a baccalaureate degree in computer science. No student (full time or part time) will be allowed to study for the Ph.D. degree beyond eight years from the date of admission into the program.

Comprehensive/Diagnostic Examination

The comprehensive/diagnostic examination for the general emphasis area is an in-depth test in the core areas of computer science: analysis of algorithms, computer architecture, database systems, communication networks, operating systems, and software engineering. The comprehensive/diagnostic examination for the computer information sciences emphasis covers the core courses for that emphasis.

The examination is used both as a comprehensive examination for the master's degree and as a diagnostic examination to screen possible Ph.D. students. There are consequently three outcomes for this examination: Ph.D. pass, M.S. pass and fail. Passing the comprehensive/diagnostic examination at the master's level is required for the master's degree while passing this examination at the Ph.D. level is necessary for Ph.D. students.

Colloquium Activities

The Computer Science colloquium series brings in researchers and practitioners from around the region, country and the world to speak of topics of interest in Computer Science. Attendance at these colloquia is an important part of a graduate education. MS students are expected to attend 10 colloquiums while the Ph.D. students are expected to attend 20 colloquiums during their tenure at ODU. For further details of the graduate program, please consult the Graduate Handbook of the Computer Science Department and the department web page www.cs.odu.edu.

Department of Mathematics and Statistics

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J. Mark Dorrepaal, Chair

Hideaki Kaneko, Graduate Program Director

N. Rao Chaganty, Statistics Program Director

Graduate Study in Computational and Applied Mathematics

The master's and doctoral programs in computational and applied mathematics offered by the Department of Mathematics and Statistics are designed to produce applied mathematicians and statisticians who can meet the growing demand for analytical and computational skills in traditional scientific and multi-disciplinary fields. Students in the program can choose to pursue an option in either applied mathematics, statistics or biostatistics.

Applied mathematics is the application of mathematics to the solution of non-mathematical problems. Such problems may originate in math-oriented fields (physics, chemistry, and engineering) as well as in such areas such as geology, oceanography, meteorology, biology, ecology, environmental health, economics, actuarial science, business (operations and market research), banking, and medicine. Students will learn to use methods of applied

mathematics, probability, statistics, biostatistics, numerical analysis, and scientific computing in seeking solutions to such problems. For work in computational and applied mathematics, training in an additional field of application is a necessity.

The desire and ability to use mathematics to bring together various disciplines is the unique characteristic of an applied mathematician. Not only has mathematical modeling and solving of societal and scientific problems increased the demand for applied mathematicians, but the flexibility and breadth of knowledge inherent in this discipline make it attractive for those who do not want to become irreversibly specialized.

Old Dominion University is one of the few American institutions offering a program expressly in applied mathematics. There are approximately 22 graduate program faculty members in the Department of Mathematics and Statistics, and current enrollment in the program is about 50 students. Areas of faculty research include analytical and numerical modeling in oceanography and meteorology, computational fluid dynamics and stability theory, elasticity and fracture mechanics, combustion theory, magnetohydrodynamics, mathematical biology, numerical analysis and approximation, optimization, applied probability, statistical inference, reliability, multivariate statistics, generalized linear models, estimating equations, biostatistics, nonparametric statistics, bioinformatics, and high performance computing.

Facilities within the metropolitan area include the NASA/Langley Research Center, the Virginia Modeling, Analysis and Simulation Center (VMASC), and the Eastern Virginia Medical School.

Program Financial Aid. Graduate assistantships in the Department of Mathematics and Statistics offer stipends ranging from \$15,000 to \$18,000. The level of award is determined on the basis of previous experience and performance as a graduate assistant and on the student's academic achievement and potential in applied mathematics or statistics. In addition, a number of teaching and research positions are available for financial support of graduate assistants during the summer months (June and July).

Writing Proficiency. All students in the graduate program are expected to demonstrate an acceptable level of writing ability. Students needing help to remedy their writing deficiencies will be referred to the Writing Center for diagnosis and assistance. All M.S. candidates will enroll in MATH 632 or in STAT 632 for a master's project.

Master of Science - Computational and Applied Mathematics

Admission

An applicant to the master's program in computational and applied mathematics should have a bachelor's degree in mathematics, statistics, computer science, or an application area with a strong mathematics component (e.g., physics or engineering). Undergraduate mathematics preparation should include course work in linear algebra, advanced calculus, differential equations, probability, and numerical methods. Undergraduate averages of 2.80 overall (4.00 scale) and 3.00 in the major and related mathematics courses are required.

A student who does not fully meet all requirements for admission as a regular graduate student may be allowed, with permission of the program director, to enroll as a provisional graduate student. Students lacking adequate preparation will be required to make up their deficiencies by taking appropriate undergraduate courses in addition to those specified for the master's program.

A formal application form, official transcripts and two letters of recommendation should be forwarded to the Office of Admissions. It is recommended that applicants supply Graduate Record Examination aptitude scores.

The following material should be mailed directly to the director of the graduate program in computational and applied mathematics, Department of Mathematics and Statistics: a list of all mathematics courses taken and other courses closely allied to the applicant's primary interests in applied math or statistics along with the texts used (titles and authors), chapters studied or topics covered, and grades. This information should be enclosed with the financial aid application (if the applicant is submitting one).

Students may enroll in the program on either a full-time or part-time basis. Courses are offered on a regular basis during the late afternoon and early evening hours which allows part-time students to obtain master's degrees or post-master's graduate credit.

Requirements

The M.S. candidate must complete a minimum of 31 normal credit hours of course work designed to fulfill an option in either applied mathematics, statistics or biostatistics. With approval of the graduate program director, up to six of these credits may be chosen from a field of application (e.g., geology, oceanography, ecosystem analysis, computer science, economics, health sciences, operations research, physics and engineering mechanics) in which the

student applies analytical and numerical techniques to another discipline. All programs of study must be approved by the graduate program director, and substitutions may be made only with his or her approval.

Master's Project Requirement. The M.S. candidate will be assigned to a faculty advisor for a master's project. Each student will enroll in MATH 632 or STAT 632 to complete his/her project. The master's project is designed not only to broaden students' analytical competency but also to enhance students' writing and reporting skills on a technical subject.

Colloquium Requirement. In order to develop an appreciation for the breadth of contemporary research in applied mathematics and statistics, all M.S. candidates will attend and succinctly summarize and evaluate in writing at least eight professional seminars given by research faculty or external seminar visitors. The Richard F. Barry Colloquium Series is run by the department throughout the academic year. The department also conducts seminars jointly with other departments.

Prerequisites. Prerequisite courses for the applied mathematics option are MATH 501, 508, 509, 517, 518 and 522. At most, three of these can be applied towards the 31-credit degree requirement. Prerequisite courses for the Statistics and Biostatistics options are MATH 316, STAT 331, 431/531, 532, 535 and 537. Only STAT 532, 535 and 537 can be applied towards the 31-credit degree requirement.

Applied Mathematics Option. Students are required to take MATH 618, 632, 637, 693; either MATH 622 or 721; and at least 15 additional credit hours of approved graduate course work.

Statistics Option. In this option, students are required to take STAT 505, 535, 537, 625, 626, 627, 628, 632, 640 and at least six additional credits of approved graduate course work.

Biostatistics Option. In this option, the required courses are STAT 505, 535, 537, 540, 550, 625, 626, 627 or 628, 640, and two 600-level courses from either the College of Health Sciences or the Eastern Virginia Medical School offerings in epidemiology, community health, or history of diseases. Also required is the master's project, STAT 632, involving the use of statistical techniques in medical or health related real-life settings.

Certificate in Modeling and Simulation

The Department of Mathematics and Statistics at Old Dominion University plays an integral part in the University's campus-wide initiative to promote its research in Modeling and Simulation. The Department of Mathematics and Statistics offers a certificate in Modeling and Simulation. In order to obtain a certificate in Modeling and Simulation, a student must complete four graduate courses that include MSIM 601 (Introduction to Modeling and Simulation). MSIM 601 is offered by the Department of Engineering Management and System Engineering. Students may select three other simulation courses from the following Modeling and Simulation courses.

Modeling and Simulation courses in Computational Mathematics. MATH 508, 509, 622, 632, 721/821, or 722/822

Modeling and Simulation courses in Statistics. STAT 535, 537, 597/697, 630, 632 or 640.

Master of Science in Education - Mathematics

Refer to the Darden College of Education section of this Catalog.

Doctor of Philosophy - Computational and Applied Mathematics

Admission

Applicants who appear to be qualified for study at an advanced graduate level may be admitted to the doctoral program in computational and applied mathematics. These will be students with very strong backgrounds in mathematics, statistics, computer science, or application areas with a mathematics component (e.g. physics or engineering).

Students may be admitted directly to the Ph.D. program with either a bachelor's or a master's degree. A grade point average of 3.00 (4.00 scale) in the major and related mathematics courses is required.

Students are required to submit three letters of recommendation and GRE aptitude scores, if the student will not have completed a master's degree by the intended date of admission.

Requirements

Course Requirements. A minimum of 55 normal credit hours of course work beyond the bachelor's degree (24 credit hours beyond the master's degree) and exclusive of doctoral dissertation work is required. Each student will be assigned a guidance committee, and together they will plan a complete program of course work designed to meet the student's objectives and to fulfill an option in applied mathematics, statistics or biostatistics. The student is strongly encouraged to select courses in more than one of these option areas

and in a field of application whenever such courses contribute appropriately to his or her program. Each program, however, must be directed and approved by the student's guidance committee.

While the individual program will depend on the nature of the student's preparation prior to entering, each participant will ordinarily be required to complete one of the following options:

Applied Mathematics Option. The required courses are MATH 605, 618, 622, 637, 638, 693, 817; MATH 801-802 and 821-822; and one of MATH 803 or 825.

Statistics or Biostatistics Option. The required core courses are: MATH 517, STAT 547, 550, 625, 626, 627, 628, 630, 640, 827, 828. Students who wish to concentrate in Biostatistics must take STAT 540 and at least six credits at the 700-level from either the College of Health Sciences or the Eastern Virginia Medical School offerings in epidemiology, community health, or history of diseases.

Colloquium Requirement. In order to develop an appreciation for the breadth of contemporary research in applied mathematics and statistics, all Ph.D. candidates will attend and succinctly summarize and evaluate in writing at least 16 professional seminars given by research faculty or external seminar visitors. The Richard F. Barry Colloquium Series is run by the department throughout the academic year. The department also conducts seminars jointly with other departments.

Foreign Language. A foreign language is not required.

Admission to Candidacy Examination. At the end of the core mathematics or statistics course work and prior to selecting a dissertation advisor, the student must pass an Admission to Candidacy Examination designed to test scholarly competence and knowledge and to give the examiners a basis for constructive recommendations on subsequent study. The written portion of this examination will be based upon an examination syllabus that will be provided to each student. The outcome of this examination will be reported to the vice provost for graduate studies and research as passed, failed, additional work to be completed, or to be re-examined. In the event of a re-examination, the outcome must be reported as passed or failed. This decision is final. The examination must be passed at least eight months prior to the granting of the degree.

Dissertation. A doctoral dissertation representing an achievement in research and a significant contribution to the field is required. Students must register for Research 898 or 899 each semester in which they are doing substantial work on their dissertations. A minimum of 24 hours of such research credit is required.

Defense of Dissertation. This examination will be oral and must be completed at least four weeks before the date on which the degree is to be conferred. The dissertation committee members must have the completed dissertation at least two weeks before the date of the oral examination. Under normal circumstances, it is expected that the student will have had a research paper accepted for publication prior to the dissertation defense.

Department of Ocean, Earth and Atmospheric Sciences

406 Oceanography and Physics Building
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757.683.4285
<http://www.odu.edu/sci/oceanography/>

Richard Zimmerman, Chair
Fred C. Dobbs, Graduate Program Director

Mission

The Department of Ocean, Earth and Atmospheric Sciences acquires and disseminates knowledge of the earth system, including the relationships among the biological, chemical, geological, and physical components of our planet. It is critical that we understand both natural and human-induced processes that change this system so we are prepared to meet present and future challenges. With curiosity, creativity, scholarship, and respect as cornerstones of our philosophy, we strive to increase scientific knowledge and literacy through excellence in research, education, and service to the Commonwealth of Virginia and society in general.

General Description of Graduate Degrees

Two graduate programs are offered: the Master of Science in ocean and earth sciences and the Doctor of Philosophy in oceanography. The Master of Science degree has both thesis and non-thesis options. Areas of emphasis are biological, chemical, and physical oceanography and geological sciences. Interdisciplinary studies are encouraged. The curriculum is designed to prepare graduates for professional practice in their area of interest. Official transcripts, letters of recommendation, TOEFL scores (international students), and a statement of goals and interest for graduate study should all be submitted to the Office of Admissions by February 1 for full consideration. Scores on the GRE verbal, analytical, and quantitative sections are required.

The department receives considerable support from the Commonwealth and local philanthropic sources, as well as from private industry and area citizens. Establishment of the Virginia Graduate Marine Science consortium by the General Assembly in 1979 demonstrated the Commonwealth's determination to achieve excellence in marine science. The purpose of the consortium is to advance marine science instruction, research, training, and advisory services and to enhance Virginia's position in seeking funding to carry out these activities. Charter members of the consortium are Old Dominion University, the University of Virginia, Virginia Polytechnic Institute and State University, and the College of William and Mary. The Samuel L. and Fay M. Slover endowment to Old Dominion University in 1986 has significantly accelerated the program of marine studies. In 1991, a Center for Coastal Physical Oceanography (CCPO) was established at Old Dominion University by the Commonwealth of Virginia. The center is a Designated Center for Excellence.

The Department of Ocean, Earth and Atmospheric Sciences is housed in three buildings. The Oceanography/Physical Sciences Building contains state-of-the-art teaching laboratories, computer facilities, and research laboratories for geological sciences and biological, chemical and geological oceanography. The Center for Coastal Physical Oceanography is located in ODU's Innovative Research Park and houses all of the department's physical oceanography laboratories. The Center for Quantitative Fisheries Ecology is housed close to campus. The department maintains a 55-foot research vessel, the R/V Fay Slover, primarily for estuarine and coastal studies. In addition to the Slover, the department has a number of small boats, suitable for near shore investigations.

Graduate Certificate in Spatial Analysis of Coastal Environments

The certificate in spatial analysis of coastal environments provides an interdisciplinary program for students wishing to pursue careers in coastal management or research, remote sensing, or geographic information systems (GIS) applications. Rendered upon completion of the requirements, the certificate is an academic affidavit comprised of courses in geography and ocean, earth, and atmospheric sciences and is administered by the two departments. Students must take courses in the areas listed below and complete them with a cumulative GPA of 3.00 or higher and no grade below a C (2.00). The certificate is available to postgraduate professionals who meet the requirements. Students with comparable professional experience may be able to show competence in selected courses through examination.

Students seeking graduate certification are required to complete the 500-level courses.

- I **Core Courses:** GEOG 504 and OCEN 514 (six credits)
- II. **Interpretive Analysis Courses:** Select two three-credit courses from the following: GEOG 502, OEAS 536, GEOG 522, GEOG 590, OEAS 595, or GEOG 595 (six credits)
- III. **Capstone Seminar:** GEOG/OEAS 519 (three credits)

Master of Science - Ocean and Earth Sciences

Fred C. Dobbs, Graduate Program Director

Admission

Applicants who have obtained a bachelor's degree in a science (e.g., biology, chemistry, geology, physics), mathematics, or engineering, with a minimum 3.00 grade point average in their major and a 2.80 overall grade point average, are eligible for regular admission to the program. At least one semester of calculus is also required. Ocean and earth sciences are interdisciplinary; consequently, it is expected that applicants have science courses outside their major.

For students wishing to study geological sciences, an undergraduate major in geology is required for regular admission. Students wishing to study physical oceanography should have majored in physics, mathematics, engineering, computer science, meteorology or related physical sciences. Such applicants must have completed 36 hours in one of these fields and completed mathematics through partial differential equations.

An applicant who does not meet all requirements for admission as a regular graduate student may be admitted as a provisional graduate student. Students lacking adequate preparation for the program may make up deficiencies by taking appropriate undergraduate courses.

Requirements

The student shall meet all university requirements for graduate degrees outlined in the Requirements for Graduate Degree section in this catalog. This includes at least 30 hours of graduate study, demonstration of competency in oral communications and demonstration of proficiency in technical writing. A maximum of 12 hours of credit may be transferred into a graduate degree program from non-degree status at Old Dominion University or from another accredited institution, except in the case of an approved interinstitutional program.

Course Distribution. A minimum of 12 hours of basic course work in the four sub-disciplines of oceanography is required of all M.S. students. This core program consists of OEAS 604, 610, 620, and 640. A student must achieve a grade of B or better in each of the core courses. The remaining 18 credits are chosen from a list of graduate courses approved by the student's guidance committee. At least 60 percent of all courses must be at the 600 level or above. For the non-thesis option, up to three hours of research may be used to meet course requirements. For the thesis option, up to six hours of research may be used to meet the course requirements.

Non-Thesis Option. For the non-thesis option, the student will demonstrate competency in oral communications by successfully completing OEAS 691 (1 credit). Proficiency in writing may be established by presenting for evaluation either a professional paper or technical report prepared by the student or a report on a current area of research in oceanography. This document must be approved by the student's advisor and the graduate program director. A student in the non-thesis program must pass a written comprehensive examination testing breadth of knowledge in oceanography. The examination is given twice yearly, normally in October and March. The examination grades are fail, pass, or pass with distinction. A student who has failed the examination may retake it only once.

Thesis Option. Before a student embarks on thesis research, a thesis advisory committee must be formed. Further information on university guidelines for forming this committee can be found in the Requirements for Graduate Degrees section of this catalog. The student must also submit a thesis proposal which outlines the research to be undertaken and identifies the resources required for completion of the research. Guidelines for the preparation of the thesis proposal are available from the graduate program director. Any student whose thesis research requires departmental funding must obtain prior approval from the department chair and graduate program director. No funds will be given without this approval. The thesis proposal requires the approval of the graduate program director and the student's thesis advisory committee.

As part of the thesis requirement, the student is required to present a public defense of the research. The public defense and approval of the thesis by the student's Thesis Committee meet the requirements for demonstration of competency in oral communication and demonstration of proficiency in technical writing; this also satisfies the comprehensive examination requirement. Students in the thesis program should consult the graduate program director regarding the preparation of the M.S. thesis, scheduling a thesis defense, and the final submission of the thesis.

Time Requirement and Field Work. Each student is required to have at least ten days of shipboard experience, fieldwork, or a combination of the two. Scheduled class field trips may not be counted toward this requirement.

Request to Graduate. The student should obtain a copy of the form Application for Graduation from the Registrar's Office and complete this application. The deadline for submitting this application is listed in the class schedule each semester and usually falls near the end of the semester preceding the one during which graduation is anticipated. It is the student's responsibility to meet these deadlines and submit the necessary paperwork for graduation.

Removal of Incompletes. At least one month prior to graduation, all incomplete grades should be cleared. An Academic Record Change form is used for this purpose, and the instructor of the course and the department chair need to sign this form.

Doctor of Philosophy - Oceanography

Fred C. Dobbs, Graduate Program Director

Admission

The doctoral degree in oceanography is granted to students who have (1) mastered definite fields of knowledge, become familiar with research in these specific fields, and developed perceptions of opportunities for further advances; (2) demonstrated the capacity to do original, independent, scholarly

investigation or creative work in their specific fields; and (3) shown the ability to integrate the field of specialization with the larger domains of knowledge and understanding.

All students in the oceanography Ph.D. program are responsible for reading and understanding the regulations and policies set forth here and throughout this catalog regarding requirements for the Ph.D. degree. The essential credit requirements for the Ph.D. are as follows. The student shall complete 48 credit hours beyond the master's degree or 78 credit hours for students admitted to the program with a bachelor's degree. Up to 24 credits can be granted for dissertation.

Requirements

Major Advisor and Guidance Committee. A major advisor must be identified to the graduate program director (GPD), at least provisionally, prior to admission to the program. After receiving admission to the program and enrolling, students consult with the GPD and their major advisor about initial course work. Before completion of nine semester hours (i.e. before the end of the student's first semester), the student will form a guidance committee in consultation with the major advisor. Please see the graduate program director and the Requirements for Graduate Degrees section of this catalog for further information on forming a guidance committee.

Plan of Study—Curriculum Plan. Sometime in the first year of study, the student shall prepare a plan of study with the aid and approval of the guidance committee. Students should see the graduate program director and refer to the Requirements for Graduate Degrees section of this catalog for further information on preparing a plan of study.

Course Work Requirements. Students who do not have an M.S. degree in oceanography normally complete the 12 hours of core courses (OEAS 604, 610, 620, and 640) within the first year. However, waiving the requirement to take any of these core courses requires the approval of the graduate program director. Students must achieve a grade of B or better in each of the core courses. Any student receiving a C (2.0) or lower in any graduate course will be dropped from the program. In consultation with the advisor and guidance committee, students will plan a complete program of course work designed to meet their objectives (see the section above). Depending on the entry status of the student, the following credit hours are also required:

Those entering the Ph.D. program with an M.S. degree in oceanography must complete any needed core courses (see above), and a minimum of 48 credit hours of lecture courses and dissertation research.

Those entering the Ph.D. program with a B.S. or M.S. degree in a discipline outside of oceanography shall complete 12 credit hours of the core courses listed above, and a minimum of 66 hours of additional lecture courses and dissertation research, for a total of 78 credit hours.

A maximum of 12 graduate credit hours may be transferred into a graduate degree program from non-degree status at Old Dominion University or from another accredited institution, except in the case of an approved interinstitutional program.

Diagnostic Examination. The guidance committee shall administer a written and oral diagnostic examination during the first semester of residence (or before nine credit hours have been completed) for students entering the program with an M.S. degree in oceanography. For students matriculating with a bachelor's degree or an M.S. degree in another field, the guidance committee shall administer the diagnostic examination no later than the third semester of residence (or before completion of 27 credit hours). The diagnostic examination will be prepared by the student's guidance committee in consultation with the graduate program director. The results of this examination are used as guidance for the curriculum plan. The guidance committee may also recommend to the graduate program director, based on the student's performance in the four oceanography core courses, that the diagnostic examination be waived. This must be done in writing, in a memo signed by all members of the student's guidance committee.

Computer Language Skills. To satisfy this requirement the student must solve a substantial problem by writing an original computer program. The student's advisor in consultation with the guidance committee develops the problem and a reasonable timetable for its completion. The problem must be solved independently with no help from others. The results will be evaluated by the advisor and guidance committee who will determine whether the student has solved the posed problem to their satisfaction. This requirement should be completed before taking the candidacy exam.

Ship Time Requirement and Fieldwork. Each student is required to have at least ten days of shipboard experience, fieldwork, or a combination of the two. Scheduled class field trips may not be counted toward this requirement.

Competency In Oral Communication. Competency in oral communication must be established before taking the candidacy examination. It is generally achieved by passing OEAS 691 (1 credit seminar class) in the student's second or third year of study. Exceptions will only be considered by the graduate program director when requested in writing by the student's advisor and

guidance committee. In general, an exception will be granted only if the student can demonstrate oral competency based on past experience, or if the student has made two oral presentations at national or international scientific meetings before having taken the candidacy exam.

Proficiency In Writing. Proficiency can be established by the satisfactory evaluation of a student's refereed paper, professional paper, or dissertation by the faculty. Generally, completion of the dissertation satisfies this requirement.

Candidacy Exam. Near the completion of course work and before becoming heavily involved in dissertation work, the student shall pass a candidacy examination designed to test scholarly competence and knowledge of oceanography. The exam has written and oral portions prepared by the guidance committee. Additional details on the structure, form and content of the candidacy exam are available from the graduate program director and in the Requirements for Graduate Degrees section in this Catalog.

Formation of a Dissertation Committee. After the candidacy examination has been passed and the dissertation committee formed, the guidance committee's responsibilities are completed. The dissertation committee is a new committee and is formed to supervise the student's dissertation research. Students should see the graduate program director or refer to the Requirements for Graduate Degrees section in this Catalog for further information on the formation of a dissertation committee.

Changes to the dissertation committee must be made in advance of the oral dissertation defense. Such changes are made only with the approval of the GPD and college dean.

Admission to Candidacy. Admission to candidacy is a formal step that occurs after the student has:

1. passed both parts of the Ph.D. candidacy examination;
2. filed a dissertation prospectus approved by the student's dissertation committee; and,
3. completed all formal course work.

The student must be admitted to candidacy at least 12 months before the time the degree is expected to be received, but usually not before the completion of one-and-a-half years of graduate work.

Dissertation Preparation. General regulations and procedures governing the submission of a doctoral dissertation are given in the Guide for Preparation of Theses and Dissertations (obtained at

<http://sci.odu.edu/sci/about/information/thesis/index.shtml>). Students should read this guide carefully before beginning to write their dissertation. Writing the dissertation as chapters that can be submitted for publication is encouraged.

Please note that the thesis and dissertation guide in place at the start of the semester will remain in force for the entire semester, and any changes made to the guide over the academic year (and the dates of these changes) will be listed on the cover page of the guide. Changes to the previous guide will also be noted on the cover page of the guide, or in a separate document that can be downloaded from the same site as the complete guide. For more information on dissertation preparation and approval in the College of Sciences, see <http://sci.odu.edu/sci/about/information/thesis/index.shtml>.

Dissertation Defense. The format of a dissertation defense is determined by the dissertation committee with the approval of the GPD. The defense is chaired by the director of the dissertation committee. The chair will act as moderator, ruling on questions of procedure and protocol that may arise during the defense. Students should see the graduate program director or refer to the Requirements for Graduate Degrees section in this catalog for further information on the format of the dissertation defense.

Satisfactory performance on this examination (oral dissertation defense) and adherence to all regulations outlined above complete the requirements for the Ph.D. degree. All requirements for the doctoral degree must be completed within eight calendar years from the date of initial registration in the program.

Dissertation Acceptance and Submission. Once the dissertation committee has approved the dissertation, the student and major advisor must go over the entire dissertation to ensure that it adheres to the format described in the Guide for Preparation of Theses and Dissertations before submitting the dissertation to the GPD for review. Three days should be allowed for this review. Once the GPD has approved the dissertation, the student submits the dissertation to the associate dean in the College of Sciences for approval. All approvals must be completed by the day before commencement. However, the associate dean generally requires that all dissertations be submitted prior to this deadline. Students should consult with the GPD for further details.

Request to Graduate. The student should obtain a copy of the form Application for Graduation from the Registrar's Office and complete this application. The deadline for submitting this application is listed on the Registrar's Office website at www.odu.edu/registrar and usually falls near the end of the semester preceding the one during which graduation is anticipated. It is the student's responsibility to meet these deadlines and submit the necessary paperwork for graduation.

Removal of Incompletes. At least one month prior to graduation, all incomplete grades should be cleared. An Academic Record Change form is used for this purpose, and the instructor of the course and the department chair need to sign this form.

Department of Physics

306 Oceanography/Physics Bldg.

(757) 683-3468

<http://sci.odu.edu/physics/>

Gail E. Dodge, Chair

Leposava Vuskovic, Graduate Program Director

The Department of Physics offers programs of study leading to both the M.S. degree in physics and the Ph.D. degree in physics. Primary focus is placed on the Ph.D. program, and most students enrolled for graduate study are enrolled in that program. Students have the opportunity to perform research in state-of-the-art facilities under faculty direction. Graduates are prepared for research at the highest levels in academia, government laboratories, and corporate laboratories.

Admission

Applicants for admission to graduate study must have an earned bachelor's degree in physics or a closely related discipline from an accredited institution or an equivalent degree from a foreign institution. The applicant is normally required to have a cumulative grade point average of 3.0 on a 4.0 scale. In addition, the general portion of the Graduate Record Examination (GRE) is required for application to either the master's or the doctoral program; applicants to the doctoral program are strongly encouraged to take the GRE specialized physics test as well. The Test of English as a Second Language (TOEFL) is required of all nonnative speakers of English who have resided in the U.S. for less than ten years.

It is normally expected that most incoming graduate students will be supported as teaching assistants. Old Dominion University requires that all graduate teaching assistants who do not speak English as a first language pass a test of spoken English (TSE). International applicants find it greatly to their advantage, therefore, to take the TSE examination from the Educational Testing Service in their home countries.

Admission decisions are based on undergraduate achievement, GRE scores, and personal reference letters. Graduate study may commence at the beginning of any academic term. Decisions regarding financial support for students entering in the fall term are normally made by April 15, so a student's completed application must be received by March 1. Anyone who applies after March 1 should communicate directly with the Department of Physics concerning the availability of support.

Master of Science - Physics

Requirements

A student may select either the thesis or non-thesis option. For either option, each student's course of study must have the advance approval of the graduate program director.

Non-Thesis Option

Thirty graduate credits that must include the following courses (credits indicated):

PHYS 556 or 621	Intermediate Quantum Mechanics OR Quantum Mechanics I	3
PHYS 603	Classical Mechanics	3
PHYS 604	Electromagnetic Theory I	3
PHYS 697	Seminar	1

No more than 12 credits numbered at the 500 level may be used to meet this requirement.

Up to 12 credits from other University departments may be used to meet this requirement if approved by the graduate program director.

Written Comprehensive Examination. In addition to these course requirements, the candidate must pass a written comprehensive examination. It is usually taken just before the student's third semester of study. If a student fails this examination, he or she is allowed a second attempt, which must be at the time when it is next given. In all but the most extraordinary circumstances, a student will not be allowed any additional attempts to pass this examination. Normally, this written examination is the same as the written portion of the Ph.D. Candidacy Examination, graded at the master's level.

Foreign language requirement. None

Thesis Option

Thirty graduate credits that must include the following courses:

PHYS 556 or 621	Intermediate Quantum Mechanics OR Quantum Mechanics I	3
PHYS 603	Classical Mechanics	3
PHYS 604	Electromagnetic Theory I	3
PHYS 697	Seminar	1
PHYS 698	Research	3
PHYS 699	Research	3

No more than 12 credits numbered at the 500 level may be used to meet this requirement.

Up to 12 credits from other university departments may be used to meet this requirement if approved by the graduate program director.

Doctor of Philosophy - Physics

Requirements

The broad requirements for the Ph.D. degree are (1) satisfactory performance in a designated core of graduate courses, (2) successful completion of the Ph.D. Candidacy Examination, which has both written and oral parts, (3) successful completion of a teaching requirement, and (4) satisfactory completion of a dissertation. Each student's course of study must have the advance approval of the graduate program director.

Course Requirements

Seventy-eight graduate credits beyond the undergraduate degree or 48 graduate credits beyond the master's degree must be taken and must include the following courses:

PHYS 601	Mathematical Methods of Physics I	3
PHYS 603	Classical Mechanics	3
PHYS 604	Electromagnetic Theory I	3
PHYS 621	Quantum Mechanics I	3
PHYS 697	Seminar	1
PHYS 804	Electromagnetic Theory II	3
PHYS 807	Statistical Mechanics	3
PHYS 808	Applied Physics Laboratory I	3
PHYS 811	Computational Physics	3
PHYS 821	Quantum Mechanics II	3
PHYS 831	Advanced Seminar I	1
PHYS 832	Advanced Seminar II	1

A minimum of six additional credits for specialized courses at the 800 level must be taken. A student may waive or substitute for any of these courses with the approval of the graduate program director.

Up to 12 credits from other university departments may be used to meet this requirement if approved by the graduate program director. A student may waive either PHYS 831 or PHYS 832, with the approval of the graduate program director, if he or she presents a paper at a scientific meeting. Before formation of his or her dissertation committee, a student is formally advised about these courses and other academic matters by graduate faculty advisors. There is no foreign language requirement.

Ph.D. Candidacy Examination

A student admitted to the Ph.D. program in physics becomes a bona fide candidate for the Ph.D. degree by passing the Ph.D. Candidacy Examination. The purpose of this comprehensive examination is to determine if a student has the foundation and maturity to begin research in physics. A student who fails to pass the Ph.D. Candidacy Examination within the allowed number of attempts explained below will be dismissed from the Ph.D. program. However, that student would still have the opportunity to satisfy the requirements for the M.S. degree in physics.

The Ph.D. Candidacy Examination consists of two parts—the Written Examination and the Oral Examination. Each part must be passed independently in order to pass the Ph.D. Candidacy Examination.

Written Examination: The written examination is given two times each year—in late August and early January. A student admitted to the Ph.D. program must take this examination by the beginning of his or her third semester of graduate study. In circumstances such that the student has not had the appropriate courses to meet this deadline, he or she may petition the Graduate Program Committee for an extension. If a student fails this examination, he or she is allowed a second attempt, which must be at the time when the Written Examination is next given. In all but the most extraordinary circumstances, a student is dismissed from the Ph.D. program after failing the written examination twice.

The written examination consists of two days of testing, with eight problems each day. Problems on the first day are from classical mechanics and classical electrodynamics; problems on the second day are from classical electrodynamics and quantum mechanics. All 16 problems must be solved.

Graduate-certified faculty members of the Department of Physics grade this examination.

Examination problems are included from both the level of advanced undergraduate physics courses (300, 400, and 500 numbered courses) and the level of the first semester of graduate quantum mechanics (PHYS 621), the first semester of graduate electricity and magnetism (PHYS 604), and graduate classical mechanics (PHYS 603). The difficulty of these questions is typical of those within the textbooks currently used in the courses cited, and a list of those textbooks is available upon request.

Oral Examination: The Oral Examination is a one-hour presentation given by a student to an oral examination committee (normally consisting of his or her dissertation committee, minus the external member), meeting in closed session, on a topic relevant to the student's dissertation research. This presentation must be made within one year after a student passes the written examination. A request for extension of the deadline must be made in writing to the Graduate Program Committee.

A student's dissertation advisor, in consultation with the student, may choose from two possible formats for this presentation: (1) a presentation by the student directly on his or her dissertation research or (2) a presentation on a specific topic that the student has been assigned to investigate for several months. (A student just beginning research might benefit from the second option.) For either option, the student must write a short paper of 10 or fewer pages on his or her presentation topic and give it to all members of the oral examination committee at least two weeks before the scheduled date of the examination. The committee, by majority vote, will determine whether the student passes or fails the oral examination. A student who fails the oral examination will be allowed a second attempt. The student's dissertation advisor will decide the format and timing of such a second attempt, with the provision that the second attempt must be completed within six months of the first attempt.

Teaching Requirement

Each candidate for the Ph.D. degree must earn a minimum of four teaching credits, which are defined in the following way: One such credit is awarded for teaching a one-hour recitation for one semester in the Department of Physics, and two such credits are awarded for teaching a one-semester laboratory course in the Department of Physics. The graduate program director may approve the substitution of an equivalent amount of teaching experience in the Department of Physics for this requirement.

Dissertation

The dissertation is the final and most important requirement that must be completed by a candidate for the Ph.D. degree in physics. It must be based on original research in physics that makes a contribution to existing knowledge and be of sufficient quality and interest to merit publication in a refereed physics journal. Research that is classified by the U. S. Government (in a way that restricts its distribution) is not a suitable basis for a dissertation, as one essential characteristic of a dissertation is that its contents must be disseminated freely.

The candidate's dissertation research is supervised generally by his or her dissertation committee. Close supervision is provided by the candidate's research advisor, who is a member of the dissertation committee and may be a tenured, tenure-track, research, or adjunct member of the graduate-certified faculty of the Department of Physics. If the research advisor is a tenured or tenure-track member of the faculty, he or she is the chair of the candidate's dissertation committee. If the research advisor is an adjunct or research faculty member, a tenured or tenure-track graduate-certified faculty member must serve as co-advisor and also serve as chair of the dissertation committee. The dissertation committee is composed of at least five members, a majority of whom must be tenured or tenure-track members of the graduate-certified faculty of the Department of Physics and one of whom must be a tenured or tenure-track faculty member of the graduate-certified faculty in a department of Old Dominion University other than the Department of Physics. It is the responsibility of the research advisor and the candidate to nominate prospective members for the dissertation committee to the graduate program director, who must formally approve the membership of the dissertation committee.

The format of the dissertation is specified by the Guide for Preparation of Theses and Dissertations, and variations allowed within the Department of Physics are specified by the graduate program director.

Dissertation Defense

The final examination that a candidate must pass in order to receive the Ph.D. is an oral examination by the dissertation committee based on the candidate's public presentation of the results contained in his or her dissertation. This defense is conducted in two phases: (1) a public presentation in front of the dissertation committee that is open to any person who may wish to attend and direct relevant questions to the candidate and (2) a closed session between the candidate and the dissertation committee in which the candidate is questioned further by that committee. The dissertation committee determines

by majority vote whether the candidate passes or fails this final oral defense. If the candidate fails, he or she is allowed only one additional attempt to pass at a later time.

Applied Physics Endorsement

A student who meets all other requirements for the Ph.D. in physics may receive an applied physics endorsement by completing PHYS 809 and 812.

Department of Psychology

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<http://sci.odu.edu/psychology/>

Barbara Winstead, Chair

Graduate Study

The Department of Psychology offers a program of study leading to the degree of Master of Science with a major in psychology and programs leading to the Doctor of Philosophy with majors in applied experimental psychology, human factors psychology and industrial/organizational psychology.

The department also participates in a program leading to the degree of Doctor of Psychology in clinical psychology. This program, under the direction of the Virginia Consortium Program in Clinical Psychology, is a joint venture of the Departments of Psychology at Old Dominion University, the College of William and Mary, and Norfolk State University and the Department of Psychiatry and Behavioral Sciences at Eastern Virginia Medical School.

Master of Science - Psychology

Louis H. Janda, Graduate Program Director

The master's program in psychology offers a course of study leading to the Master of Science with a major in general psychology. The master's degree program is appropriate for students wishing to enter a doctoral program at Old Dominion or another university or for those seeking the master's as a terminal degree. The curriculum is designed to provide a strong background in research methods and general psychology so that the student will have a wide range of choices for future professional development.

Graduate students are encouraged to work closely with members of the faculty and to participate in the research and other professional activities that are available within the department. Faculty are involved in research in the general areas of clinical, social, developmental, neuropsychological, human factors, organizational, personnel, and community psychology. Currently, faculty and students are engaged in research projects on various topics, including: body image, psychological testing, coping with stress and depression, personal relationships, metacognition, parenting, work-family conflict, adaptive automation, community interventions to improve driving and pedestrian behavior, modeling and simulation, reactions to alarms, vigilance, human use of in-vehicle navigation systems, telework, women and minorities in information technology occupations, coping with chronic disease, behavioral psychopharmacology, and personnel selection.

Admission

To qualify for admission, a candidate must meet the general university admission requirements. In addition, the candidate must present: (1) undergraduate courses in statistics and experimental psychology and nine additional hours in psychology; (2) official scores on the aptitude section of the Graduate Record Examination (GRE) (applicants who do not have a bachelor's degree in psychology must also take the advanced psychology GRE test); and (3) transcripts of all undergraduate and graduate work. A brief statement by the student outlining personal goals and academic objectives and three letters of reference (at least two of which are from former college or university teachers) are requested. All credentials in support of applications should be sent to the Office of Admissions.

Requirements

To qualify for the Master of Science in psychology, a student must meet the following requirements:

1. The student must maintain a B average (3.00 on a 4.00 scale) in a minimum of 36 hours of course work.
2. The student is required to successfully complete a core of courses established by the faculty with at least a B (3.00) average in these

courses. The core courses consist of the following: PSYC 713 and 714 (Research Project I & II), 727 and 728 (Statistics and Research Methods I & II), 731 (Cognition) or 741 (Sensation and Perception), and 651 (Developmental) or 749 (Advanced Social). Completion of the core is a prerequisite for beginning work on the thesis (including registration for PSYC 698 and 699), or non-thesis comprehensive exam. Full-time students must complete the core courses in the first year, and part-time students must do so in the first two years.

Following completion of the core course requirements, students will elect either the thesis or non-thesis option for completing the degree. Students choosing the thesis option complete 30 hours of course work plus six hours of research and thesis. The thesis option is required for students wishing to pursue doctoral training. Prior to beginning research, the student will submit to the graduate program director a written thesis proposal. When the student has completed the research, a written thesis must be submitted to the thesis committee. Completion of the thesis depends on the acceptance of the written thesis by the thesis committee and the graduate program director, as well as on passing an oral examination in a public defense of the thesis.

The educational and professional goals of some students are better served by completing the work for the master's degree without the thesis component. Students who elect the non-thesis option complete 36 hours of course work, including at least three hours of practicum. Non-thesis students are required to pass a comprehensive exam in an area of expertise identified by the student in conjunction with his/her comprehensive exam committee. Prior to preparation for the exam, the student will submit to the graduate program director a proposed reading list.

Writing proficiency is essential for successful performance in this program. When it appears that remediation is required in writing skills, the student will be referred to the Writing Center for diagnosis and writing improvement activities. Student performance will be monitored by the graduate program director. Students will be advised when their performance does not meet minimum requirements.

Certificates of Concentration

Certificates of concentration may be earned by students receiving a master's degree in psychology. To obtain a certificate in one of three possible areas, the student must complete 12 credit hours of courses relevant to the area of concentration and maintain a minimum GPA of 3.00 in those courses. Course credit hours to fulfill the core requirements for the master's degree may not be used toward a certificate of concentration. The student must also complete a research project or practicum relevant to the area of concentration. A research project must be documented to the master's program committee in the form of either a written paper or a conference presentation. The following is a list of the three areas and the relevant courses for each area:

Psychopathology and Assessment

Required: PSYC 661, 663, and 664

Other relevant courses: PSYC 653, 672

Quantitative and Assessment

Required: PSYC 723, 663 and/or 664

Other relevant courses: PSYC 726, 745, 763

Applied Cognitive Psychology

Required: PSYC 731 and 741 (only three credit hours count toward certificate)

Other relevant courses: PSYC 651, 663, 672, 749, 770

Courses not listed, but relevant to a certificate, may be used to fulfill the requirements for the certificate as approved by the master's program committee. The student should make such requests in writing to the master's program chair.

Doctor of Philosophy - Applied Experimental Psychology

Barbara A. Winstead, Program Director

Admission

The graduate program in applied experimental (AE) psychology admits students at two levels: with a master's degree or with a bachelor's degree. Degrees held must be in psychology or a related field. Each applicant must submit:

1. official scores on the General Test of the Graduate Record Examination (GRE); Applicants with degrees from fields outside psychology must also submit GRE scores for the Subject Test in psychology;

2. a brief statement outlining personal goals and academic objectives; three letters of reference, at least two of which are from former college/university teachers or research supervisors; and,
3. transcripts of all prior academic work.

Overview of Topical Areas

The AE program is designed to provide (a) broad doctoral training firmly based on psychological theory and basic behavioral science, (b) great depth of knowledge broadly spread over the fundamental areas of experimental psychology, and (c) concentration in an area of experimental psychology for applied settings. The general philosophy and plan of the AE psychology program at Old Dominion University is to provide graduate training consisting of four phases: (1) a core of basic psychology, acquired primarily at the master's level; (2) in-depth training in statistics, methodology, and grant and manuscript writing; (3) research experience in a field of AE psychology; and (4) completion of a dissertation representing a significant contribution to AE psychology. For example, two research fields with which numerous faculty members are involved are health psychology and developmental psychology.

Requirements

The Ph.D. degree in AE requires at least 84 semester hours of credit beyond the bachelor's degree or at least 48 semester hours of post-master's training. Students entering the program with a bachelor's degree must complete the first phase of the program by meeting the requirements for the master's degree in general psychology (i.e., 36 semester hours with appropriate course work). For the student with a bachelor's degree, completion of the program requires approximately five years of study. For the student who holds the master's degree upon entering the Ph.D. program, completion requires approximately three years. The student is required to complete a core of master's-level courses with at least a B average. The core courses consist of the following: PSYC 813 and 814 (Research Project I and II); PSYC 827 and 828 (Analysis of Variance and Experimental Design; Regression and Correlational Design); either PSYC 831 (Cognition) or 841 (Sensation and Perception); and either PSYC 651 (Developmental) or 849 (Advanced Social). Attaining the master's degree requires two years of study.

Students pursuing the Ph.D. in AE are also required to take: PSYC 734/834 (Proseminar in Applied Experimental Psychology); and, PSYC 845 (Psychometric Theory)

Near the completion of the master's degree requirements, the student forms a guidance committee of graduate faculty members who assist in developing a plan of study tailored to the student's needs and interests. The plan of study outlines the minimum of 48 hours of postmaster's training, including (a) completion of the remaining required course (PSYC 833, Grant and Manuscript Writing), (b) completion of one additional quantitative course (3 credits), (c) maintenance of a strong focus in research methods and statistics, (d) completion of supplementary courses to support the chosen specialty (e.g., health-related courses to be taken by health specialists), and (e) development of a viable research program.

Candidacy Examination. Prior to admission to candidacy (i.e., the beginning of formal work on the dissertation), each student is required to pass a written and oral candidacy examination. There are two options for this requirement. (1) Qualifying Exam: questions assess (a) core experimental psychology (statistics, methodology, experimental principles, ethics; four hours) and (b) a specialty area (research program and relevant content knowledge; eight hours). An oral examination follows the written, during which the student defends answers to the written components (two hours). (2) Major Area Paper: a review paper (quantitative or qualitative) or theoretical analysis of a research area designated by the student as an important area for contemporary applied experimental psychology. The resulting paper should define the student as an expert in that area, and be of publishable quality. The student must submit the work for publication in a journal relevant to the student's research specialty before this option is passed.

Research Emphasis. A major objective of the AE psychology program is to provide the student with substantial experience in planning, designing, conducting, and reporting results of independent research. Toward this end, a student is expected to engage in a variety of research activities. This expectation is reflected in the program's few traditional classroom course requirements beyond the master's degree. The time should be spent on mostly research-related activities (e.g., reading, individual study [research], and dissertation). The student is expected to acquire research experiences that go well beyond formal course requirements. These research experiences may take a variety of forms and occur in a variety of settings. For example, the student is encouraged to engage in both laboratory and field research related to the AE specialty, to serve as a member of a larger research team when appropriate or available (perhaps serving as a graduate research assistant on an externally sponsored grant), and to engage in independent non-sponsored research. The student is also encouraged to seek out opportunities to conduct research

projects (including grants and contracts funded through the Old Dominion University Research Foundation) on his or her own and in collaboration with faculty members. The accumulation of these research experiences should result in presentation of papers at professional meetings, the publication of manuscripts in refereed journals, the publication of technical reports, and the submission of grant/contract proposals.

Graduate Student Teaching. Teaching a course is an experience that is worthwhile regardless of the eventual career role(s) that a student envisions, and the experience should be taken seriously for its professional value. Benefits associated with teaching a course include expanding and solidifying knowledge about general and AE psychology, polishing communication skills, and establishing professional identification. Although there are other ways to acquire these benefits (e.g., presentations at conferences, consulting experiences, organizing and conducting workshops), teaching a course systematically builds these experiences into a student's Plan of Study. Moreover, any student who plans an academic career should teach one or more courses in preparation for that career. The student should also recognize that during the course of graduate training, financial support is often provided by the Psychology Department from graduate teaching assistant or adjunct teaching funds. This type of financial support almost always requires that the student be partially or fully responsible for teaching a course. The student should be prepared for an eventual obligation to teach a psychology course by enrolling in Teaching of Psychology (PSYC 815).

Dissertation. The doctoral dissertation must represent an achievement in research and a significant contribution to knowledge in the major area of study.

Dissertation Defense. An oral examination in defense of the dissertation is required. The aim of the defense is to explore with the candidate the methodological and substantive contributions of the completed dissertation.

Doctor of Philosophy - Human Factors Psychology

Barbara A. Winstead, Program Director

Admission

The graduate program in human factors (HF) psychology admits students with bachelor's or master's degrees from psychology or related fields. Each applicant must submit: (1) official scores from General Test of the Graduate Record Examination (GRE). Applicants with degrees from fields outside psychology must also submit GRE scores for the Subject Test in psychology; (2) a brief statement by the student outlining the prospective student's personal goals and academic objectives; (3) three letters of reference, at least two of which are from former college or university teachers; and (4) transcripts of all prior academic work including grades for experimental methods and statistics courses or equivalent. Applicants are also encouraged to submit a writing sample.

Overview of the Topical Areas

The HF doctoral program follows the scientist-practitioner model with emphasis on psychological theory and behavioral science, statistics and research methodology, and practical experience, and fundamental and innovative areas of human factors/engineering psychology. The following is a partial list of these areas: aviation psychology, behavioral modeling, complex system operation, display design, driving and navigational performance, behavior, ergonomics, human-computer interaction, perception and performance, medical systems, neuroergonomics, simulation, team performance, training, usability testing, warnings and alarms, virtual environments, information processing and workload.

Requirements

The program requires at least 84 semester hours of credit beyond the bachelor's degree or approximately 48 hours of postmaster's education. For the individual entering with a bachelor's degree, the general plan of graduate education consists of four phases: (1) a core of basic psychology, acquired while working toward the master's degree; (2) broad education in the general area of human factors psychology, (3) research and applied experience in human factors psychology, and (4) completion of a dissertation representing a significant professional contribution to human factors psychology. For the individual entering with a master's degree, a minimum of 48 hours of doctoral-level credits is required, based on the faculty's and the Ph.D. programs director's review of the student's educational background. Students who enter with a master's degree will typically pursue a plan of study identical in spirit to the latter three phases of the plan of study followed by a student entering with a bachelor's degree (see phases listed above).

For the student with a bachelor's degree, completion of the program requires approximately five years of study. For the student who holds the master's degree upon entering the Ph.D. program, completion will require approximately

three years. A student entering the program with a bachelor's degree must complete the first phase of the program by meeting the requirements for the master's degree in general psychology (i.e., 36 semester hours with appropriate course work). The student is required to complete successfully a core of master's-level courses, with at least a B average in these courses. The core courses consist of the following: PSYC 813 and 814 (Research Project I and II), PSYC 827 and 828 (Analysis of Variance and Experimental Design, Regression and Correlational Design), 831 (Cognition), 841 (Sensation and Perception) and one of the following: 651 (Developmental) or 849 (Advanced Social). Completion of the first phase requires two years of study.

During the second semester of the student's second year, the student forms a guidance committee of graduate faculty members who assist in developing a plan of study tailored to the student's needs and interests. The plan of study outlines the student's minimum of 48 hours of postmaster's education.

Candidacy Examination. Prior to admission to candidacy (i.e., the beginning of formal work on the dissertation), each student is required to pass a qualifying examination covering the breadth of the general HF discipline as well as the student's primary area of concentration. The examination consists of a written part (eight hours) and an oral part (two hours).

Publication and Application. Prior to graduation, students are required to demonstrate their ability to assume first authorship in a refereed journal, and to create an application of research methodology and/or computing skills. An example of such an application might include a data analysis program, a simulation program or a patentable technology innovation.

Practical Experience. The student must obtain professional practice experiences during the course of graduate education. An internship is one excellent option for meeting this requirement. However, the student can also meet the requirement by participating in at least two applied research projects or consulting activities under the direct supervision of Ph.D. psychologist(s). The student's guidance committee establishes the criteria for meeting the professional-practice experience requirement and judges the adequacy of the experiences.

Dissertation. The doctoral dissertation must represent an achievement in research and a significant contribution to knowledge in the major area of study. It is equivalent to no more than 24 semester hours of course work.

Dissertation Defense. An oral examination in defense of the dissertation is required. The aim of the defense is to explore with the candidate the methodological and substantive contributions of the completed dissertation.

Research Opportunities. Lab facilities are available for research in cognition, human perception and performance, modeling and simulation, and psychophysiology. Facilities include personal computers, local area networked testing stations, sound-attenuated testing chambers, driving simulators, flight simulators, a human-computer interaction laboratory, and EEG and ERP recording equipment. Access to university computing and multimedia development facilities is also available. To complement the program's emphasis on modeling and simulation, students also have access to the Virginia Modeling, Analysis and Simulation Center (VMASC). VMASC is an ODU-affiliated research and development center where scientists from a number of disciplines create and test computer models and simulation applications to benefit industrial, academic, and governmental interests.

Research is supported by private sector, local, state or federal governmental organizations (e.g., National Science Foundation, National Institutes of Health, NASA, etc.), or one of the military services. Doctoral students are encouraged to become engaged in one of these research programs early in the process of their education.

Doctor of Philosophy - Industrial/Organizational Psychology

Barbara A. Winstead, Program Director

Admission

The Doctor of Philosophy (Ph.D.) program in industrial and organizational (I-O) psychology admits students with bachelor's or master's degrees from psychology or related fields. Each applicant must submit: (1) official scores on the Graduate Record Examination including the verbal, quantitative, analytical writing. Applicants with degrees from fields outside psychology must also submit GRE scores for the Subject Test in psychology; (2) a brief statement outlining the prospective student's personal goals and academic objectives; (3) a sample of recent academic writing (e.g., a paper required in an undergraduate course); (4) three letters of reference, at least two of which are from former college or university teachers; and (5) transcripts for all prior academic work.

Overview of the Topical Areas

The program covers current theoretical and practical issues and topics within I-O psychology. The following is a partial list of these areas: job analysis, psychological testing, selection systems, personal training including e-training, human resource development, human resource management, study of work organizations and organizational influences on individuals, work motivation, work-family interface, job satisfaction, organizational commitment, leadership, group and team processes, organization development and change and perceived fairness in the workplace, new forms of work organization such as telework and virtual teams, and international aspects of I-O psychology.

Requirements

The program requires at least 84 semester hours of credit beyond the bachelor's degree or approximately 48 hours of postmaster's education, which includes up to 24 dissertation research credits. For the individual entering with a bachelor's degree, the general plan of graduate education consists of four phases: (1) course work in general psychology, acquired while working toward the master's degree; (2) broad education in the general area of I-O psychology, (3) research and professional-practice experience in I-O psychology, and (4) completion of a dissertation representing a significant professional contribution to I-O psychology. For the individual entering with a master's degree, a minimum of 48 hours of doctoral-level credits is required, based on a review of the student's educational background by the faculty and the Ph.D. programs director. The entering student holding a master's degree must pursue a plan of study identical in spirit to the latter three phases of the student with the bachelor's degree (see phases listed above).

For the student with a bachelor's degree, completion of the program requires approximately five years of study.

For the student who holds the master's degree upon entering the Ph.D. program, completion requires approximately three years. A student entering the program with a bachelor's degree must meet the requirements for the master's degree in general psychology (i.e., 36 semester hours with appropriate course work). The student is required to complete a core of master's-level courses with at least a B average. The core courses consist of the following: PSYC 813 and 814 (Research Project I and II); PSYC 827 (Analysis of Variance and Experimental Design), PSYC 828 (Regression and Correlational Design), and PSYC 845 (Psychometric Theory). In addition, students must take two of the following courses: PSYC 850 (Organizational Psychology), PSYC 863 (Personnel Psychology), PSYC 651 (Developmental), 831 (Cognition), 841 (Sensation and Perception), or 849 (Advanced Social). Attaining the master's degree requires two years of study.

During the second semester of the student's second year, the student must form a guidance committee of graduate faculty members who assist in developing a plan of study tailored to the student's needs and interests. The plan of study outlines the student's minimum of 48 hours of postmaster's education.

Candidacy Examination. Prior to admission to candidacy (i.e., the beginning of formal work on the doctoral dissertation), each student is required to pass a candidacy exam. There are two methods a student might use to pass the candidacy exam: (1) The student publishes three manuscripts, at least one as first author, in peer-reviewed journals; (2) The student completes a qualifying examination covering the student's areas of specialization. The candidate is examined broadly in the areas, not merely in a single aspect of concentration. The examination consists of a written part (12 hours) and an oral part (two hours).

Practical Experience. The student must obtain professional practice experiences during the course of graduate education. An internship is one excellent option for meeting this requirement. However, the student can also meet the requirement by active involvement in applied research or consulting activities under the direct supervision of one or more Ph.D. psychologists. The student's guidance committee establishes the criteria for meeting the professional-practice experience requirement and judges the adequacy of the experiences.

Dissertation. The doctoral dissertation is a significant and creative research achievement and a significant contribution to knowledge in I-O psychology. An oral examination in defense of the dissertation is required. The aim of the defense is to evaluate the doctoral candidate's mastery of the methodological and substantive contributions of the completed dissertation.

Research Opportunities. Laboratory and field research programs are conducted by the I-O faculty on such diverse topics as selection systems, training systems, development and implementation of performance appraisal systems, team performance and assessment, work-family interface, workplace diversity and inclusion, organizational change, innovation management, telework, virtual teams, and international I-O issues. Research is supported by a variety of agencies such as the National Science Foundation; National Institutes of Health; the NASA/Langley Research Center; the Virginia Modeling, Analysis and Simulation Center; and the military services. Students are

encouraged to become engaged in one of these research programs early in the process of their education.

Doctor of Psychology - Clinical Psychology

Robin J. Lewis, Graduate Program Director

The Department of Psychology participates in a program that awards the degree of Doctor of Psychology (Psy.D.) in clinical psychology. This program, offered through the Virginia Consortium Program in Clinical Psychology, is a joint venture of the Departments of Psychology at Old Dominion University, the College of William and Mary, and Norfolk State University and the Department of Psychiatry and Behavioral Sciences at Eastern Virginia Medical School. The combined efforts of these institutions give considerable breadth and depth to this unique program. The emphasis of the program is on the training of highly skilled psychologists. The program uses a “practitioner-scientist” model that emphasizes a balanced integration of clinical and scientific training. The program is fully accredited by the American Psychological Association.

Admission

Detailed information about the program and a downloadable application are available at the program’s website: www.sci.odu.edu/vcpcp. To be admitted to the Doctor of Psychology program, the student must have a baccalaureate degree and an acceptable background in psychology. In addition, the applicant

must present: (1) official scores on the Graduate Record Examination; (2) a brief statement outlining personal goals and academic objectives; and (3) three letters of reference. A personal interview is also required.

Requirements

The Doctor of Psychology program provides students with a high level of professional training. The program consists of a minimum of four years of post-baccalaureate training. The curriculum involves a specific sequence of required courses to ensure mastery of the knowledge and skills necessary for professional competence. The first two years (six semesters) provide for an intense program of basic behavioral science and clinical courses and practica. In the third year, students complete their advanced training practica and course work as well as an empirical doctoral dissertation. The one-year full-time clinical internship is completed during the fourth year. The internship is not provided by the Virginia Consortium.

Student Evaluation. Students are regularly evaluated in both course work and practicum activities. A formal evaluation of students’ progress is conducted annually. At the end of the second year, each student is evaluated through a written and oral comprehensive examination that covers both course and clinical competence.

Dissertation Award

The David Leigh Pancoast Award is given to the student in the Virginia Consortium Program in Clinical Psychology with the outstanding doctoral dissertation.

College of Sciences Graduate Courses

Course Prefixes

Biological Sciences—BIOL
Chemistry and Biochemistry — CHEM
Computer Science — CS
Mathematics and Statistics
Math Pedagogy – MAPD
Mathematics — MATH
Statistics - STAT
Ocean, Earth and Atmospheric Sciences —
OEAS
Physics — PHYS
Psychology — PSYC
Sciences - SCI

Biological Sciences — BIOL

BIOL 400/500. Flowering Plant Families. Lecture 3 hours; laboratory 4 hours; 5 credits. Prerequisites: BIOL 292 (BIOL 303 and 308 recommended). An evolutionary survey of flowering plant families; emphasis on recognition and identification of plant families and the principles and methodologies that define them; and evolution of biodiversity. Focus on local representatives and large families in the field and laboratory. An activity oriented, hands-on course.

BIOL 401/501. Entomology. Lecture 3 hours; laboratory 3 hours; 4 credits. Prerequisites: BIOL 291 and 292. A comprehensive survey of the insects, including taxonomy, morphology, physiology, reproductive and developmental biology, and ecology. Research techniques in entomology will be learned through both field and laboratory work.

BIOL 404/504. Conservation Biology. Lecture 3 hours; laboratory 4 hours; 5 credits. Prerequisites: BIOL 291, junior standing or permission of instructor. The application of fundamental biological principles to the preservation of biodiversity, including the role of ecological and evolutionary theory to the preservation of biotas on a regional and global basis. Lectures will cover modern approaches to conservation biology, including conservation ethics and management issues. Laboratories will include discussion of case studies, introduction to software applicable to conservation biology, presentations by regional conservation practitioners, and visits to relevant field sites.

BIOL 407/507. Molecular and Immunological Techniques. Lecture 1 hour; laboratory 6 hours; 4 credits. Prerequisites: BIOL 293 and 303. A laboratory intensive, hands on course covering many current methods in molecular biology.

BIOL 409/509. Immunology. Lecture 3 hours; 3 credits. Prerequisite: BIOL 315 or permission of the instructor. A comprehensive study of the phenomena of immune resistance, the cells and tissues involved in immune responses, and the consequences of immunization.

BIOL 410/510. Immunology Laboratory. Laboratory 4 hours; 2 credits. Prerequisite: junior standing. Serologic and cellular immune reactions and other immunologic methodologies.

BIOL 412/512. Plant Physiology. Lecture 3 hours; laboratory 3 hours; 4 credits. Prerequisite: BIOL 292. Corequisites: BIOL 293 and CHEM 311. A study of the physiological processes which occur in plants. A laboratory and greenhouse oriented course stressing plant nutrients, cell

metabolism-respiration, photosynthesis, nitrogen metabolism, and plant hormones.

BIOL 414/514. Plants of the Bible and The Koran. Lecture 3 hours; 3 credits. Prerequisites: BIOL 308, junior standing or permission of instructor. A survey of plants occurring in the sacred texts, their uses, history and lore.

BIOL 415/515. Marine Ecology. Lecture 3 hours; 3 credits. Prerequisites: BIOL 115N, 116N, 331 and previous course in ecology. When offered during the fall semester, Marine Ecology Laboratory (BIOL 442/542) is a corequisite. An introduction to ecological processes in the marine environment, with an emphasis on coastal ecosystems. The course covers synthetic topics as well as the ecology of specific marine habitats.

BIOL 416/516. Clinical Immunology. Lecture 2 hours; 2 credits. Prerequisite: BIOL 409/509. A description of common immunological problems seen in the clinic.

BIOL 419/519. Wetland Plants. Lecture 2 hours; laboratory 6 hours; 5 credits. Prerequisites: BIOL 291 and 308. A field-oriented course on the identification of plants used to delineate wetlands including ecology, variability, and distribution.

BIOL 420/520. Ichthyology. Lecture 3 hours; laboratory 4 hours; 5 credits. Prerequisites: BIOL 292 and junior standing. The biology of marine and freshwater fishes including morphology, physiology, evolution, distribution, ecology, and reproduction.

BIOL 421/521. Ornithology. Lecture 3 hours; 3 credits. Prerequisites: BIOL 291, 292 or permission of the instructor. The basic biology of birds, their evolution, behavior, classification, and ecological relationships. Biology majors must take BIOL 422 to receive concentration credit for this course.

BIOL 422/522. Field Studies in Ornithology. Lecture 2 hours; laboratory 4 hours; 3 credits. Prerequisites: BIOL 291, 292 or permission of the instructor. A combined lecture and field study of birds with emphasis on identification, behavior, and structure. Extensive field trips, including at least one weekend, are taken.

BIOL 423/523. Cellular and Molecular Biology. Lecture 3 hours; 3 credits. Prerequisites for 423: BIOL 293 and 303. Prerequisite for 523: course background in cell biology and genetics or permission of instructor. The molecular organization of eucaryotic cells is presented along with cell evolution, molecular genetics, the internal organization of the cell and the behavior of cells in multicellular organisms.

BIOL 424/524. Comparative Animal Physiology. Lecture 3 hours; laboratory 4 hours; 5 credits. Prerequisite: BIOL 291. An introduction to the basic mechanisms by which different animals function. How organisms acquire and use energy, regulate their internal environment, circulate and exchange gases and wastes, receive and conduct information about their environment, and move and use muscles will be some of the topics covered. Emphasis will be on how organisms make changes in these basic mechanisms to deal with differing environmental conditions.

BIOL 426/526. Histology. Lecture 3 hours; laboratory 4 hours; 5 credits. Prerequisites: BIOL 250, 293. The structure and function of cells, tissues and organs at both the light microscopic and ultrastructural levels.

BIOL 427/527. Neurobiology. Lecture 3 hours; 3 credits. Prerequisites: BIOL 250/251 or 458/558. Survey of current areas of neurobiology including evolution of the nervous system from

invertebrates through primates and mechanisms of nervous system function such as sensation and biological clocks.

BIOL 428/528. Physiological Ecology of Animals. Lecture 3 hours; 3 credits. Corequisite: BIOL 292. Prerequisite: BIOL 291. An integrative approach to understanding how animals function in and respond to their natural environment. Adaptations by a variety of invertebrate and vertebrates to marine, coastal/estuarine, freshwater, terrestrial, and parasitic environments will be covered. Responses of intertidal organisms to periodic aerial and aquatic exposure, osmotic stress on crustaceans in brackish waters, sensory adaptations in freshwater fish, thermal regulation by reptiles in desert climates, and respiratory adaptation by parasites are among the topics that will be discussed.

BIOL 430/530. Microbial Pathogenesis. Lecture 3 hours; 3 credits. Prerequisite for 430: BIOL 315. Prerequisite for 530: microbiology course. Examination of bacterium-host interactions with an emphasis on how bacteria cause disease, particularly the means by which the bacterium is able to circumvent host defense mechanisms.

BIOL 431/531. Mammalogy. Lecture 3 hours; laboratory 4 hours; 5 credits. Prerequisites for 431: BIOL 291, 292, junior standing or permission of the instructor. Prerequisite for 531: undergraduate ecology and evolution courses. The ecology, behavior, distribution, physiology, diversity, and evolution of mammals.

BIOL 433/533. Cave Biology. 4 credits. Prerequisites: BIOL 291, 292 and permission of the instructor. An examination of the distribution, ecology, and evolution of subterranean organisms and ecosystems. A four-day field trip to selected caves and karst areas in the Appalachians is required.

BIOL 438/538. Dendrology. Lecture 2 hours; laboratory 5 hours; 4 credits. Prerequisite: BIOL 308 or equivalent. The study of trees and shrubs, their identification, ecology, structure and anatomy, lore and uses. A field-oriented course.

BIOL 441/541. Animal Behavior. Lecture 3 hours; laboratory 4 hours; 5 credits. Prerequisites: BIOL 291, 292 or permission of the instructor. Animal behavior with special attention to its evolution and ecological significance. Field and laboratory activities will emphasize observational and experimental techniques used to study behavior.

BIOL 442/542. Marine Ecology Laboratory. 4 hours; 2 credits. When offered during the fall semester, Marine Ecology (BIOL 415/515) is a corequisite. A laboratory/field course in which students gain practical experience with research techniques common to coastal marine ecology, and become familiar with the organisms and ecological conditions present in the various marine habitats visited by the class. A field trip of several days is required.

BIOL 443/543. Environmental Impact Assessment. Lecture 3 hours; 3 credits. Prerequisite: biology major or permission of the instructor. Topics will include the history and legislation pertaining to environmental impact assessment. Emphasis will be placed on ecological concerns and management of tidal and nontidal wetlands plus shore line and estuarine habitats. Assignments will include evaluation of environmental impact conditions within this region.

BIOL 444/544. Experimental Marine Ecology. Lecture 2 hours; laboratory 6 hours; 5 credits. Prerequisite: BIOL 331. A lecture/field

course in experimental design and the use of quantitative ecological techniques in addressing scientific questions in marine ecology. The course includes lectures on techniques, field exercises where techniques are employed, computer-based data analysis, and written reports of research project results. A week-long research trip to a marine laboratory is required.

BIOL 445/545. Community Ecology. Lecture 3 hours; 3 credits. Prerequisite: BIOL 291 or equivalent. The goal of this course is to introduce and evaluate both classical and emerging paradigms in community ecology. This will be achieved by examining those processes (biotic and abiotic) that structure ecological communities, and by developing skills in statistical analyses and modeling to objectively weigh the evidence presented in support of these paradigms.

BIOL 446/546. Comparative Biomechanics. Lecture 3 hours; 3 credits. Prerequisite: BIOL 291; recommended courses: PHYS 111N, 112N. The principles of fluid and solid mechanics will be applied to a variety of plant and animal systems to understand how organisms deal with the immediate physical world and its accompanying constraints. A diverse range of topics will be covered, including aerial flight in insects, wind resistance in trees, jet propulsion in squid, flow within blood vessels, forces on intertidal organisms, viscoelasticity in biological materials, and energy storage during terrestrial movement.

BIOL 450/550. Principles of Plant Ecology. Lecture 2 hours; laboratory 4 hours; 4 credits. Prerequisites: BIOL 291 and senior standing. Course covers the general theoretical concepts in plant ecology with statistical methods. The structure, development, processes, and history of plant communities are studied. Laboratories involve extensive fieldwork. A weekend field trip is required.

BIOL 454/554. Parasitology. Lecture 2 hours; laboratory 4 hours; 4 credits. Prerequisites: BIOL 293 and 303. A basic course which treats parasitism as one of several biological interactions. The principles discussed are structural and physiological adaptations to parasitism, host specificity, immunity, parasitic life cycles, and evolution of parasitism. Representative species are examined in the laboratory.

BIOL 455/555. Molecular Systematics. Lecture 3 hours; 3 credits. Prerequisites: BIOL 115N, 116N, 292 and 303. An introduction to the processes and procedures used to reconstruct the evolutionary history of living organisms using chromosomes, proteins, and nucleic acids. Topics include project planning and sampling, molecular techniques, and analytical and tree-building programs used to infer phylogeny. Assignments include readings followed by participation in group discussions and an oral presentation followed by a written paper on the analyses of a molecular data set.

BIOL 456/556. Population Genetics. Lecture 3 hours; 3 credits. Prerequisite: BIOL 303. An introduction to the principles of population genetics and addresses topics such as inheritance, genetic variation, fitness, natural selection, mutation, genetic drift, gene expression, and single- and multi-locus models of different types of selection. Human disease is addressed. Students will write a mock-grant proposal.

BIOL 457/557. General Virology. Lecture 3 hours; 3 credits. Prerequisites: BIOL 115N, 116N, 293 and 303 for BIOL 457 only. For 557, students are expected to have had courses in cell biology and genetics prior to enrollment in the course. A

basic course covering the history of virology, viral taxonomy, genetics, and the molecular biology and host responses to the major mammalian virus groups. Examples or recent impacts of viruses on human health such as influenza pandemics will also be covered.

BIOL 458/558. Comparative Anatomy of the Chordates. Lecture 2 hours; laboratory 6 hours; 5 credits. Prerequisites: BIOL 115N, 116N, and 292. The evolution of form in chordates, with an emphasis on the vertebrates. Changes in the function and adaptive significance of structures through time are considered. The detailed anatomy of representative species is introduced and compared in the laboratory.

BIOL 459/559. Genomics. Lecture 3 hours; 3 credits. Prerequisites: BIOL 115N, 116N, 293 and 303. This course will introduce genomics as a scientific approach that combines molecular biology, high-throughput methodologies, bioinformatics and computing to reveal the secrets hidden within a genome. Topics will include how whole genomes are studied, including large scale sequencing, RNA expression profiling, proteomics and bioinformatics.

BIOL 460/560. Frontiers in Nanoscience and Nanotechnology. Lecture 1 hour; 1 credit. Prerequisites: BIOL 293, junior, senior or graduate standing for 560. Review of the structure, synthesis and properties of key nano-materials and their impact on living systems.

BIOL 461/561. Human Cadaver Dissection. Lecture 2 hours; laboratory 4 hours; 4 credits. Prerequisite: BIOL 250-251 or equivalent. Students will dissect a human cadaver and learn all major structures. All exams will be practical tag-tests using human tissue. The major emphasis will be on head, neck, trunk, and joints with some clinical application to injuries and surgery.

BIOL 473/573. Herpetology: The Biology of Amphibians and Reptiles. Lecture 3 hours; laboratory 4 hours; 5 credits. Prerequisites: BIOL 292 and junior standing or permission of the instructor. The biology of amphibians and reptiles, emphasizing their evolution, classification, and morphological and ecological adaptations. Field trips and laboratory exercises introduce techniques for observation, collection, preservation, and study.

BIOL 474/574. Mushrooms. Lecture 2 hours; laboratory 6 hours; 4 credits. Prerequisite: BIOL 308. The identification, classification ecology, culture, and uses of mushrooms and other fleshy fungi. A field oriented course.

BIOL 477/577. Origins of Biological Principles. Lecture 3 hours; 3 credits. Prerequisites: BIOL 115N and 116N or BIOL 108N and 109N plus a minimum of 6 credits of biology courses at the 200 level or above, all taken before enrollment. Covers the historical origins of major concept areas in the biological sciences including evolution, cell biology, ecology, systematics, botany, biomedical sciences, and molecular biology. Includes discussions of the philosophers and scientists behind the discovery of these principles. Includes a significant writing component.

BIOL 478/578. Microbial Ecology. Lecture 3 hours; 3 credits. Prerequisite for 478: BIOL 315 or equivalent or permission of instructor. Prerequisite for 578: a general microbiology course. Study of the interactions between microorganisms, particularly bacteria, and their environment. Emphasis is placed on nutrient cycling and the influence of microbes on global mineral dynamics. The effects of physical and chemical factors on distribution and activity of

microbes in their environments and applications of these interactions are studied (biotechnology).

BIOL 479/579. Microbial Ecology Laboratory. Laboratory 3 hours; 1 credit. Corequisite or prerequisite: BIOL 478/578. A laboratory for measurement of microbial numbers and activity in natural environments.

BIOL 480/580. Advanced Human Physiology Laboratory. Laboratory 4 hours; 2 credits. Corequisite or prerequisite: BIOL 250/251. A study of the cardiovascular, respiratory, nervous and digestive systems using mammals.

BIOL 490/590. Advanced Human Physiology. Lecture 4 hours; 4 credits. Prerequisite: BIOL 250 or equivalent. All major physiological systems with emphasis on normal physiology. Some clinical applications made but not stressed.

BIOL 496/596. Topics. 1-3 credits. Prerequisites: BIOL 115N/116N, junior standing, permission of instructor. A specially designed, structured course concerning specific topics in the biological, environmental, or allied health fields.

BIOL 498/598. Independent Study. 1-3 credits. Prerequisites: BIOL 115N/116N, junior standing, permission of the CDA, permission of instructor. Supervised (non-lab/field) project selected to suit the needs of the individual student. Requires completion of formal scientific paper documented with appropriate primary technical literature (see CDA for details). Unstructured course.

BIOL 587. Human Anatomy for Athletic Trainers. Lecture 3 hours; laboratory 2 hours; 4 credits. Prerequisite: BIOL 250. An advanced course in human anatomy with particular stress on osteology, arthrology, and extremities. Dissection of human cadaver material will be required.

BIOL 605. Current Biological Concepts. Lecture 3 hours; 3 credits. A biology refresher course which will also update students as to major biological concepts concerning cell structure and function, genetics, diversity and ecology. Emphasis will be placed on the development of projects teachers may use for classroom presentations. The course cannot be used by graduate-level students in fulfilling their graduate program course requirements.

BIOL 608. Graduate Seminar. 1 credit. Presentation of reports or reviews of history or literature, and discussion by graduate students, staff and visiting scientists on modern developments in biology.

BIOL 609. Special Readings. 3 credits. Reading and discussion course designed to explore a field of specific interest. Fall and spring semester.

BIOL 620. Biometry. Lecture 4 hours; 4 credits. Prerequisite: STAT 130M. A first course, or a refresher course, in statistical methods and experimental design for graduate students in biology and the natural sciences. The focus is on application and hypothesis testing with examples drawn from the field of biology. The course requires a significant amount of work outside the classroom on homework exercises and an independent project.

BIOL 632. Marine Microbiology. Lecture 3 hours; laboratory 3 hours; 4 credits. Prerequisite: BIOL 315 or permission of the instructor. A study of marine microorganisms in relation to their environment. Emphasis is placed on the influence of physical and chemical factors on the distribution and function of microorganisms in the marine environment.

BIOL 661. Special Topics in Biology. 1-3 credits. Supervised projects and practica selected to meet the specific objectives of the student.

BIOL 669. Internship. 3 credits. With approval of Advisory Committee.

BIOL 672. Responsible Conduct of Research. Lecture 1 hour; 1 credit. Required of all graduate students admitted to Biology programs. The course will introduce students to the responsible conduct of science and scientific research.

BIOL 695. Topics. 1-3 credits. A specially designed course concerning specific topics in the biological, environmental or allied health fields.

BIOL 698. Research. 1-3 credits.

BIOL 699. Thesis. 3 credits. This course is selected with the recommendation of the faculty advisor.

BIOL 700/800. Cardiovascular Physiology. 4 credits. This physiology course will focus solely on Cardiovascular Physiology. Lectures will focus on basic and advance cardiovascular principles. The laboratory will focus on the use of current cardiovascular research.

BIOL 702/802. Biomedical Sciences Journal Club. 1 credit. Review and discussion of current papers in the areas of biomedical sciences. Student presentation, discussions and readings in this field required.

BIOL 704/804. Disease Vector Ecology. Lecture 3 hours; laboratory 3 hours; 4 credits. Study of the role of insects, ticks and other invertebrates in the transmission of disease. Emphasis is on biochemical and physiological aspects of microbial survival in the vector and transmission to vertebrate hosts by these vectors. Laboratory includes experiments to study how pathogens (non-human) are acquired, maintained and transmitted.

BIOL 705/805. Advanced Microbiology. Lecture 2 hours; laboratory 4 hours; 4 credits. Prerequisite: A microbiology course. Investigate microbiology from historical perspectives to modern molecular microbiology; ecological and biomedical components; bacteria and viruses. Laboratory will involve designing experiments conducting and evaluating results.

BIOL 707/807. Ecosystem Ecology. Lecture 3 hours; laboratory 4 hours; 5 credits. Prerequisite: a general ecology course. Ecological principles at ecosystem level of biological organization. Discussion of energy flow, nutrient cycling, ecosystem stability and ecosystem modeling. Laboratory involves field trips and methods of measuring ecosystem parameters.

BIOL 708/808. Ecological Sciences Seminar. 1 credit.

BIOL 712/812. Electron Microscopy. Lecture 1 hour; laboratory 6 hours; 4 credits. Prerequisite: permission of the instructor. Lectures will cover theory and concepts of specimen preparation and operation of scanning and transmission electron microscopes. The laboratory experience will include all phases of electron microscopy from specimen preparation to finished micrograph.

BIOL 714/814-715. Biomedical Sciences Laboratory. 2 credits. Prerequisite: approval of the program director. Three laboratory rotations (6 credits) are required by the curriculum.

BIOL 716/816. Endocrinology. Lecture 3 hours; laboratory 4 hours; 5 credits. Prerequisites: BIOL 312 or permission of the instructor. The biochemical integration of hormones and related agents on vertebrate physiology with emphasis on human endocrinology. Recent literature will be stressed.

BIOL 720/820. Systematic Ichthyology. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisite: BIOL 520. A systematic survey of fishes emphasizing life history, anatomy, identification and classification.

BIOL 730/830. Emerging Infectious Diseases. Lecture 3 hours; 3 credits. Prerequisite: A microbiology course. Discussion on current studies into new and reemerging infectious diseases with an examination of the infectious agent and factors involved in disease emergence, prevention and elimination.

BIOL 731/831. Systematics and Speciation. Lecture 3 hours; 3 credits. Principles of systematic biology and discussion of speciation theory, with emphasis on generation, analysis, and interpretation of taxonomic data and application of these data to a better understanding of classification and speciation processes. Modern theories of evolutionary biology and phylogenetics will be stressed. A research paper is required.

BIOL 745/845. Advanced Immunology. Lecture 3 hours; 3 credits. Current concepts in cellular and molecular immunology and host defense based on critical review of the primary literature.

BIOL 749/849. Biogeography. Lecture 3 hours; 3 credits. Emphasis on historical biogeography, utilizing both dispersal and vicariance models for explanations of the geographic distribution of organisms. Ecological explanations are also considered. Useful techniques for biogeographic analyses, such as comparison of area cladograms are discussed at length.

BIOL 750/850. Marine Benthic Ecology. Lecture 2 hours; laboratory 4 hours; 4 credits. Prerequisite: BIOL 415 or equivalent. Application of ecological principles at the community level to marine benthic environments. Discussion of community structure, animal-sediment relationships, roles of benthic communities in marine ecosystems.

BIOL 752/852. Quantitative Ecology. Lecture 4 hours; 4 credits. Prerequisite: Biometry or equivalent. Advanced quantitative approaches as applied to ecological questions. Lecture/discussion/project format will focus on experimental/research design and the uses of multiple regression, descriptive multivariate statistics, multi-factor and multivariate ANOVA, and categorical data analysis. Extensive use of computerized statistical analysis.

BIOL 755/855. Molecular Genetics. Lecture 3 hours; 3 credits. Prerequisite: graduate standing and BIOL 523. Current molecular understanding of genetic processes will be reviewed. Applications to areas such as development and evolution will also be covered.

BIOL 758/858. Molecular Ecology. 4 credits. Prerequisite: BIOL 407/507, or equivalent. Scientist are increasingly using molecular methods to help them address fundamental questions in the population ecology and evolution of biological species. This class will introduce graduate students to the basic concepts and methods in molecular evolution, phylogenetics and methods into their research. Theory and concepts from lecture will be illustrated through reading and discussion of current scientific literature. Students will also directly apply the course material to a class project investigating population structure of marine species from the tropical Indo-Pacific, for which they will be trained in methods of DNA extraction, PCR and sequencing. They will present

their results orally in a mini-symposium at the end of the course.

BIOL 765/865. Retroviruses and Retroelements. Lecture 3 hours; 3 credits. A course encompassing the biology of infectious retroviruses such as HIV, the human immunodeficiency virus and related elements in the human genome. Students will learn about the structure, genetics, biology, evolution, and diseases associated with retroviruses and endogenous retroelements.

BIOL 770. Advanced Study. Tutorial; 3 credits. Under the guidance of members of the graduate faculty and with the approval of the program track coordinator, the student will carry out in-depth studies of selected topics relevant to the area of specialization. Extensive surveys and analyses of the literature. Written reviews, comprehensive and synoptic, and oral presentations are required of each student.

BIOL 789/889. Gross Anatomy. Lecture 4 hours; laboratory 4 hours; 6 credits. Prerequisite: anatomy course at any level—BIOL 250, 251, 301, 314, or 330. An intense study of all systems from a regional approach. Extensive dissection required in lab. Clinical applications utilized.

BIOL 795/895. Special Topics. 1-4 credits. Prerequisite: permission of the instructor.

BIOL 861. Ecological Sciences Internship. 3-6 credits. Must have approval of advisory committee.

BIOL 880. Advanced Study. Tutorial; 3 credits. Under the guidance of members of the graduate faculty and with the approval of the program track coordinator, the student will carry out in-depth studies of selected topics relevant to the area of specialization. Extensive surveys and analyses of the literature. Written reviews, comprehensive and synoptic, and oral presentations are required of each student.

BIOL 898. Research. 1-6 credits.

BIOL 899. Dissertation. 1-6 credits.

BIOL 999. Biological Sciences 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Chemistry and Biochemistry — CHEM

(Note: + = A lecture course having an associated laboratory)

CHEM 415/515. Intermediate Organic Chemistry. Lecture 3 hours; 3 credits. Prerequisite: CHEM 211-213 or CHEM 311-313 with a grade of C or higher. An in-depth treatment of the chemistry of carbon compounds, including reaction mechanisms, spectral techniques, polymerization, pericyclic reactions, and biomolecules.

CHEM +421/521. Instrumental Analysis Lecture. Lecture 3 hours; 3 credits. Prerequisite: CHEM 333 with a grade of C or better. Designed to be taken concurrently with CHEM 422/522. A study of the basic principles of spectroscopic, chromatographic, and electrochemical methods of quantitative chemical analysis. Methods of chemical instrumentation are also included.

CHEM 422/522. Instrumental Analysis Laboratory. Laboratory 6 hours; 3 credits. Prerequisite: CHEM 332W with a grade of C or better. Pre- or co-requisite: CHEM 421/521 with a grade of C or better. An intensive laboratory study of the principles of analytical chemistry.

Experiments in spectroscopic, chromatographic, and electrochemical methods are conducted to illustrate fundamental principles and to provide the opportunity to develop skills in the use of instrumentation for chemical measurement.

CHEM +441/541. Introductory Biochemistry. Lecture 3 hours; 3 credits. Prerequisite: CHEM 213 or 313 with a grade of C or better. This course is a one-semester survey of the major molecular constituents, bioenergetics, enzymes, nucleic acid structure, and genetic information transfer pathways fundamental to biochemistry.

CHEM 442W/542. Biochemistry Laboratory. Lecture 1 hour; laboratory 6 hours; 4 credits. Prerequisite: CHEM 441/541 with a grade of C or better. Prerequisites: CHEM 213, 214, BIOL 293, 303 with a grade of C or better. Principles and techniques of biochemical procedures involving amino acids, protein characterization and isolation, enzymology, bioinformatics, nucleic acids, and common molecular biology techniques for DNA and RNA manipulations will be presented. Skills in report writing and library skills are developed.

CHEM +443/543. Intermediate Biochemistry. Lecture 3 hours; 3 credits. Prerequisite: CHEM 441/541 with a grade of C or better or equivalent. This course presents and in-depth study of protein structure, folding, and synthesis. The major metabolic pathways will be studied in detail regarding thermodynamics and mechanism of regulation or control of individual enzymes and entire metabolic pathways. Concepts of metabolic disease will be introduced and effects on integrated metabolism will be presented.

CHEM +451/551. Advanced Inorganic Chemistry. Lecture 3 hours; 3 credits. Prerequisites: CHEM 333 and 351 with a grade of C or better. Theoretical aspects of modern inorganic chemistry: bonding theories, stereochemistry, acid-base theories, coordination compounds, organometallic and bioinorganic compounds.

CHEM 452/552. Inorganic Chemistry Laboratory. Laboratory 4 hours; 2 credits. Co- or prerequisite: CHEM 451/551 with a grade of C or better. Synthesis of metal and nonmetal inorganic compounds and organometallic compounds, their characterization by modern physical methods, and a study of their properties.

CHEM 453/553. Essentials of Toxicology. Lecture 3 hours; 3 credits. Prerequisite: CHEM 213 or 313 with a grade of C or higher. Fundamental principles of toxicology: dose-response relationship, toxicologic testing, chemical and biological factors influencing toxicity, organ toxicology, carcinogenesis, mutagenesis, teratogenesis.

CHEM 460/560. Frontiers in Nanoscience and Nanotechnology. Lecture 1 hour; 1 credit. Nanotechnology presents unparalleled opportunities for advances in technology and medicine. Simultaneously, nanotechnology presents new challenges to organisms and to our environment. These undefined risk factors threaten to slow the development of new technologies and novel medical therapies. This course will review: structure, synthesis and properties of key nanomaterials; key applications of nanomaterials in technology and medicine; and impacts of nanomaterials on plant and animal physiology and the environment more generally. This course will be team-taught by faculty members in Biological Sciences, Chemistry and Biochemistry, and Engineering.

CHEM 665. Biochemistry-Biophysics

Colloquium. Lecture and discussion 1 hour; 1 credit. Prerequisite: permission of the instructor. Papers from the current literature.

CHEM 669. In-Service Practicum. 6 credits; 50 hours per credit. Prerequisites: CHEM 631, 632. One semester of work experience in local hospital, forensic, or industrial laboratory. Available for pass/fail grading only.

CHEM 685-687. Frontiers in Chemistry. 1-3 credits each semester. Prerequisite: permission of the department chair. Topics representing the most recent advances in various fields of chemistry or ones which represent an interdisciplinary advancement.

CHEM 690. Seminar. 1 credit. Master's students attend seminars given by researchers from across the country in order to expose them to additional areas of research in chemistry and biochemistry.

CHEM 691. Master's Seminar. 2 credits. Master's students attend seminars; attend a class on giving seminars; and present a seminar on their own research.

CHEM 695. Selected Topics. 1-3 credits each semester. Prerequisite: permission of the department chair.

CHEM 698. Master's Research. 1-9 credits.

CHEM 699. Master's Thesis. 3 credits.

CHEM 701. Advanced Analytical Chemistry. Lecture 3 hours; 3 credits. Prerequisites: CHEM 333, 423, 424, 425 or permission of the instructor. The theoretical foundation of analysis with emphasis on recent analytical developments and current literature.

CHEM 702. Advanced Analytical Chemistry II. Lecture 3 hours; 3 credits. Prerequisites: Instrumental Analysis (or its equivalent). This course will review the most cutting-edge Advances Analytical Chemistry Instrumentation and Methods, spanning over three core areas of analytical chemistry (Spectroscopy, Separation and Electrochemistry) and offer the in depth understanding of objectives, motivations, and future directions of Advanced Analytical Chemistry Instrumentation. The course will focus on advanced instrumentation and methodologies that can achieve ultra sensitive analysis and detection, including single molecular spectroscopy, nanoparticle probes, high-speed separation in microfluidic devices, ultramicroelectrodes for sensing and imaging.

CHEM 703. Chromatographic Separations by HPLC and GC. Lecture 3 hours; 3 credits. Prerequisites: CHEM 333, 425. This course covers basic principles of chromatography emphasizing high performance liquid chromatography (HPLC) and gas chromatography (GC), as well as separation modes, instrumentation, detection methods, quantification, and sample preparation including solid phase extraction. Examples from environmental sciences, biosciences and industry will be stressed.

CHEM 704. HPLC and GC Laboratory. Laboratory 4 or 6 hours; 2 or 3 credits. Corequisite: CHEM 703. This lab course consists of six to seven independent HPLC and GC exercises based on examples from environmental, bioscience, and industrial applications.

CHEM 715. Automation and Management of the Clinical Chemistry Laboratory. Lecture 1 hour; 1 credit. Prerequisite: CHEM 631 or permission of the instructor. The basic principles of management of the clinical chemistry laboratory and regulatory issues in laboratory management are presented.

CHEM 716/816. Electrochemical Methods of

Analysis. 2 credits. Prerequisite: CHEM 333 and CHEM 420/520, or permission of instructor. This course presents the fundamental principals and practical applications of modern electrochemical methods of analysis. Lectures and text readings cover the basic concepts and fundamental principals of this division of analytical techniques. Detailed descriptions and demonstrations of modern electrochemical research instrumentation will be provided. Students will obtain hands-on experience with this instrumentation by performing a required chemical determination using an electroanalytical method, and by undertaking a special analytical project. Research applications of other electroanalytical techniques and instrumentation, in addition to those actually used by the students in this course, will be discussed and/or demonstrated.

CHEM 718/818. Chemistry Materials. 3 Credits. Solid state band theory is approached from a molecular orbital point of view.

CHEM 720. Experimental Design and Data Treatment. Lecture 3 hours; 3 credits. Prerequisite: CHEM 321. A hands-on approach to experimental design and multivariate data analysis. Modern computer-based chemometric theories will be presented.

CHEM 722/822. Bonding and Group Theory. 3 credits. Introduction to group theory and application to problems in bonding and spectroscopy.

CHEM 723. Modern Synthetic Organic Chemistry. Lecture 3 hours; 3 credits. Prerequisite: CHEM 515 or a pass in the organic placement exam. Design of complex organic molecules. Topics covered will include: retrosynthetic analysis, stereochemical control and contemporary methods.

CHEM 724/824. Bioinorganic Chemistry. 3 credits. Prerequisite: CHEM 451/551 or equivalent. This course is a survey of the mechanisms of biochemical activity of the trace elements. Topics include oxygen uptake, oxidation-reduction, metabolism, and toxicity.

CHEM 725. Physical Organic Chemistry. Lecture 3 hours; 3 credits. Prerequisite: CHEM 415/515. Approaches to the study of reaction mechanisms, including molecular orbital theory, thermochemistry, kinetics, isotop effects, solvent and substituent effects (including linear free energy relationships), acidity, acid catalysis, and detection of reactive intermediates.

CHEM 726. Medicinal Chemistry. Lecture 3 hours; 3 credits. Prerequisite: CHEM 721 or permission of the instructor. Study of the chemistry and mode of action of various medicinal and physiologically active compounds.

CHEM 734/834. Organic Spectroscopy. 3 credits. Prerequisites: CHEM 415/515 or a pass in the organic placement exam. Organic functional group and structure analysis with ultraviolet, infrared, nuclear magnetic resonance, mass, and other spectroscopic techniques.

CHEM 736/836. Introduction to Organic Synthesis. 3 credits. Prerequisites: CHEM 415/515 or a pass in the organic placement exam. Detailed coverage of fundamental organic transformations with emphasis on reduction, oxidation, carbon-carbon bond formation, and protecting group strategy.

CHEM 741. Stable Isotope Chemistry. Lecture 3 hours; 3 credits. Prerequisite: CHEM 425. This course investigates the stable isotope systematics of carbon, nitrogen, hydrogen, oxygen and sulfur in biological, chemical and geological systems. Course material includes analytical

methods, fractionations and applications of stable isotope analyses in a wide range of natural systems. Recommended to graduate students in chemistry, earth sciences and biological sciences with an interest in environmental processes.

CHEM 742/842. Advanced Mass Spectroscopy. 3 credits. Prerequisites: CHEM 423/523. This course trains students in the theory and application of advanced mass spectrometric methods as used in all subdisciplines of chemistry and biochemistry.

CHEM 743. Organic Geochemistry. Lecture 3 hours; 3 credits. Prerequisite: CHEM 313. Organic geochemistry is the study of organic compounds originally produced by photosynthesis and altered as they cycle through the soils, atmosphere, rivers, oceans, and crustal rocks. This course will include the carbon/oxygen cycles, biomarkers, organic matter diagenesis/catagenesis, analytical techniques used in organic geochemistry, and an introduction to carbon isotopes.

CHEM 744/844. NMR Spectroscopy. 3 credits. Prerequisites: CHEM 415/515. This course presents the basics of NMR spectroscopy. Topics include basic NMR theory, NMR instrumentation, one- and two- dimensional ^1H and ^{13}C techniques, and introduction to solid-state NMR.

CHEM 748. Environmental Chemistry Laboratory. Laboratory 6 hours; 3 credits. Prerequisite: CHEM 321 or permission of the instructor. Study of the basic principles and methods of trace chemical analysis of environmental systems, including spectroscopic, chromatographic, and electrochemical instrumental methods, in addition to wet chemical methods.

CHEM 749. Environmental Chemistry. Lecture 3 hours; 3 credits. Prerequisite: CHEM 321. An overview of the natural chemistry systems operating in the atmosphere, in the terrestrial environment (both water and soils), and in the oceans, and the potential effects that human activities may have on them. Specific topics include the origin and evolution of the earth and life, the chemistry of the atmosphere (including the ozone layer and greenhouse effect), the organic and inorganic components of soil and water, chemical weathering of rocks, metal complexation, biological processes in soil and water, and global-scale chemical processes.

CHEM 755. Computational Chemistry. Lecture 3 hours; 3 credits. Prerequisite: CHEM 333. Comprehensive overview of *ab initio* (quantum) calculations and molecular dynamic simulations, the two most widely used computational methods. Plus a brief overview of other computational applications in chemistry and biology.

CHEM 756/856. Inorganic Reaction Mechanisms. 3 credits. Prerequisites: CHEM 451/551 or Equivalent. This course is a survey of the major mechanisms of inorganic and organometallic chemistry. Topics include kinetics, ligand substitution, electron transfer, and photochemistry.

CHEM 757/857. Organic Chemistry Mechanisms. 3 credits. Prerequisites: CHEM 725/825. The application of physical organic techniques to study the mechanisms of key organic reactions and the structures of reaction intermediates. Includes photochemistry and pericyclic reactions.

CHEM 762/862. Advanced Techniques in Biochemistry. Laboratory 2-6 hours; 1-3 credits. Prerequisites: CHEM 541, 542, 543. A laboratory

course in modern experimental methodology and instrumentation in biochemistry.

CHEM 765. Advanced Biochemistry. Lecture and discussion 3 hours; 3 credits. Prerequisites: CHEM 541 and 543 or permission of the instructor. Topics will include: macromolecular structure, function, thermodynamic stability and folding kinetics; protein chemistry; molecular biology; molecular mechanisms of disease and bioinformatics.

CHEM 767. Enzymology. Lecture 3 hours; 3 credits. Prerequisite: CHEM 441/541. Consideration of experimental methods for examining the kinetic data and rate equations from enzymes, examination of various models of enzyme catalysis, comprehensive presentation of the mechanisms of coenzyme action, and studies of mechanism of enzyme action.

CHEM 769. Nucleic Acids Biochemistry. Lecture 3 hours; 3 credits. Prerequisite: CHEM 541 and 543 or permission of the instructor. A comprehensive presentation of the chemistry of RNA and DNA. Modern concepts of gene regulation, the control over transcription, RNA processing and translation, cell cycle control and molecular carcinogenesis.

CHEM 775. Physical Biochemistry. Lecture 3 hours; 3 credits. Prerequisites: CHEM 333 and 541. Physical characterization of macromolecules, polarized light, absorption and fluorescence, sedimentation and transport hydrodynamics, electrophoretic mobility, light scattering, and structural x-ray crystallography of proteins and nucleic acids.

CHEM 779. Kinetics and Thermodynamics. Lecture 3 hours; 3 credits. Prerequisite: CHEM 333. A survey of modern theories of reaction rates and mechanisms, classic thermodynamic functions, and an introduction to statistical thermodynamics.

CHEM 795. Selected Topics in Chemistry and Biochemistry. Lecture and discussion 3 hours; 3 credits. Prerequisite: permission of the instructor. Thorough coverage of areas selected to meet special needs and interests.

CHEM 814-815. Biomedical Sciences Laboratory. 2 credits each semester. With approval of the program director.

CHEM 816. Biomedical Sciences Laboratory. 2 credits. With approval of the program director.

CHEM 890. Chemistry Seminar. 1 credit. Students attend seminars given by researchers from across the country on order to expose them to additional areas of research in chemistry and biochemistry.

CHEM 891. Doctoral Seminar. 2 credits. Students attend seminars; attend a class on giving seminars; and present a seminar on their own research.

CHEM 895. Selected Topics in Biomedical Sciences. Lecture 1-3 hours; 1-3 credits each semester. Lecture and discussion of recent advances in the field of biomedical sciences.

CHEM 898. Doctoral Research. 1-9 credits.

CHEM 899. Dissertation. 1-9 credits.

CHEM 999. Chemistry 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Computer Science — CS

CS 410/510. Professional Workforce Development I. Lecture 3 hours; recitation 1 hour; 3 credits. Prerequisites: A grade of C or better in CS 300 and 350. Laboratory work required. Provides students with challenges of business environments in developing a technology based project. Students identify a societal problem, identify solutions, define project solutions, develop project objectives, conduct feasibility analysis, establish organizational group structure to meet project objectives and develop formal specifications. Students make formal technical project presentations and develop web documentation. Students prepare a draft grant proposal.

CS 411W/511. Professional Workforce Development II. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in CS 330 and 410. Laboratory work required. Students write professional and non-technical documents and continue the development of the project defined in CS 410. Written work is reviewed and returned for corrective rewriting. Students will design and develop a project prototype, and demonstrate the prototype to a formal panel along with delivering the formal product specifications and a draft formal grant proposal. (qualifies as a CAP experience)

CS 417/517. Computational Methods and Software. Lecture 3 hours; 3 credits. Prerequisites: MATH 316 and a grade of C or better in CS 250. Laboratory work required. Algorithms and software for fundamental problems in scientific computing. Topics: properties of floating point arithmetic, linear systems of equations, matrix factorizations, stability of algorithms, conditioning of problems, least-squares problems, eigenvalue computations, numerical integration and differentiation, nonlinear equations, iterative solution of linear systems.

CS 418/518. Web Programming. Lecture 3 hours; 3 credits. Prerequisites: A grade of C or better in CS 312 and 330. Laboratory work required. Overview of Internet and World Wide Web; web servers and security, HTTP protocol; web application and design; server side scripts and database integration, and programming for the Web.

CS 419/519. Internet Databases. Lecture 3 hours; 3 credits. Prerequisites: A grade of C or better in CS 312 and 450. Laboratory work required. Database applications of the Internet. Explore database management systems suitable for implementing database applications over the Web. Database issues: design, human computer interface (HCI) techniques, WWW user survey results, and Web-site evaluation criteria for designing web database applications. Dynamic web page creation, and Semantic Web. Using database tools on the Internet such as Oracle Developer Forms.

CS 450/550. Database Concepts. Lecture 3 hours; 3 credits. Prerequisites: A grade of C or better in CS 381 and either CS 330 or 361. Laboratory work required. Database Architecture. The relational model and relational algebra. SQL and PL/SQL. Entity Relationship Modeling. Functional dependencies and normalization. Network databases. Transactions, concurrency and recovery.

CS 451/551. Software Engineering Survey. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in CS 330 or 361. Laboratory work required. Evaluation of software development methodologies. Topics include: software life cycle models, software specification and design methodologies, informal specification techniques,

formal specifications, design tools, software analysis, quality assurance, life cycle management, software costing models and complexity.

CS 452/552. Database Software Development Methodology. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in CS 450/550. Laboratory work required. Investigate advanced methodologies for the design and development of software in database environments. Focus on component-based architectures and/or object-oriented paradigms. Applying elements of these methodologies to modern database application environments, such as data marts, data warehousing, and data mining. Projects include constructing multi-tier application software applying these methodologies using a state-of-the-art database platform.

CS 454/554. Network Management. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in CS 455. Laboratory work required. The administration of computer networks and their interaction with wide area networks: network topologies for local and wide area networks, common protocols and services, management of distributed file services, routing and configuration, security, monitoring and trouble-shooting.

CS 455/555. Introduction to Networks and Communications. Lecture 3 hours; 3 credits. Prerequisites: STAT 330 and a grade of C or better in CS 270. Laboratory work required. OSI and TCP/IP reference models and protocols. Hardware survey, datalink, network, and transport layers. Broadcast and point-to-point networking techniques, routing, switching, and LAN media access. Internetworking, ATM, Gigabit Ethernet, wireless networks, and network security.

CS 456/556. Database Administration I. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in CS 381 and either CS 330 or 361. Laboratory work required. Programming in SQL and PL/SQL and hands-on development of DBA administration skills in the ORACLE database environment. Creating database objects, querying and manipulating, and PL/SQL programming constructs. Setup and administer databases. Create, organize, and manage database files, users, privileges and other resources.

CS 457/557. Database Administration II. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in CS 456/556. Laboratory work required. Advanced DBA administration skills in the Oracle database environment. Topics in planning and implementing backup and recovery of the database. Performance optimization and tuning of database and applications including memory and disk structures. Configuration and maintenance of clients and servers in a network environment.

CS 458/558. Unix System Administration. Lecture 3 hours; 3 credits. Prerequisite: experience with UNIX. Laboratory work required. Aspects of administering a SOLARIS/UNIX operating system in a networked environment are covered. Topics covered include installation, file system management, backup procedures, process control, user administration, device management, Network File Systems (NFS), Network Information Systems (NIS), UNIX security, Domain Name Services (DNS), and integration with other operating systems.

CS 460/560. Computer Graphics. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in CS 361. Laboratory work required. An introduction to graphical systems and methods. Topics include basic primitives, windowing, transformations, hardware, interaction devices, 3-D

graphics, curved surfaces, solids, and realism techniques such as visible surface, lighting, shadows, and surface detail. Requires project involving OpenGL programming.

CS 461/561. Computer Vision. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in CS 361. Laboratory work required. Edge detection, image segmentation and registration, image filtering and enhancement, discrete image transforms, texture analysis, feature extraction, pattern classification, object tracking, object recognition, image annotation.

CS 475/575. Introduction to Computer Simulation. Lecture 3 hours; 3 credits. Prerequisites: STAT 330 and a grade of C or better in CS 330 or 361. Laboratory work required. Efficient implementation methods. Time management. Planning and design of simulation experiments. Statistical issues in simulation. Generation of random numbers and stochastic variates. Programming with graphically- and text-based simulation languages. Verification and validation of simulation models. Distributed simulation. Special topics such as HLA will be discussed.

CS 476/576. Systems Programming. Lecture 3 hours; 3 credits. Prerequisites: A grade of C or better in CS 330 and 361. Laboratory work required. This course is to help students fully understand and utilize the internal workings and capabilities provided by modern computing, networking and programming environments. Topics include: Shell Script Programming, X Windows (Xlib and Motif), UNIX internals (I/O, Processes, Threads, IPC and Signals), Network Programming (UDP/TCP Sockets and Multicasting) and Java Systems Programming (SWING, Multithreading and Networking).

CS 477/577. System Programming in Windows Operating Systems. Lecture 3 hours; 3 credits. Prerequisites: A grade of C or better in CS 330 and 471. Laboratory work required. Gain a basic understanding of systems programming for the Microsoft Windows® system programming platforms. This course covers the software architecture of current Windows® programming environments. Topics include desktop and network application programming.

CS 480/580. Introduction to Artificial Intelligence. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in CS 361. Laboratory work required. Introduction to concepts, principles, challenges, and research in major areas of AI. Areas of discussion include: natural language and vision processing, machine learning, machine logic and reasoning, robotics, expert and mundane systems.

CS 486/586. Introduction to Parallel Computing. Lecture 3 hours; 3 credits. Prerequisites: MATH 316; knowledge of a high level language. Laboratory work required. The motivation for and successes of parallel computing. A taxonomy of commercially available parallel computers. Strategies for parallel decompositions. Parallel performance metrics. Parallel algorithms and their relation to corresponding serial algorithms. Numerous examples from scientific computing, mainly in linear algebra and differential equations. Implementations using public-domain network libraries on workstation clusters and computers.

CS 488/588. Principles of Compiler Construction. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in CS 361. Laboratory work required. Theoretical and practical aspects of compiler design and

implementation. Topics will include lexical analysis, parsing, translation, code generation, optimization, and error handling.

CS 495/595. Topics in Computer Science. 1-3 credits. Prerequisite: permission of the instructor.

CS 497/597. Independent Study in Computer Science. 1-3 credits. Prerequisite: permission of the instructor. Independent study under the direction of an instructor.

CS 600. Algorithms and Data Structures. Lecture 3 hours; 3 credits. Prerequisite: CS 361. Design of efficient algorithms and the mathematical analysis of their performance. Topics to be covered include: mathematical preliminaries, sorting and order statistics, advanced data structures, linear programming, exploring graphs, parallel algorithms, randomized algorithms, transformation of the domain, and NP-completeness. (offered fall)

CS 635. Parallel Computer Architecture. Lecture 3 hours; 3 credits. Prerequisite: CS 665. This is a first course in parallel architecture, with an emphasis on the description and evaluation of commercially available machines. Topics to be covered include: parallelization and performance metrics, scalability and the "laws" of Amdahl and Gustavson, computational similarity, models of computation, parallelization paradigms, network characteristics and topology, communication calculus and templates, pipelining and parallelism, processor types, memory hierarchy, cache coherence protocols, latency-hiding mechanisms, routing algorithms, and languages and libraries to support parallel architecture.

CS 648. Computational Geometry and Applications. Lecture 3 hours; 3 credits. Prerequisite: CS 483 or equivalent. This course is concerned with the design and analysis of algorithms for solving geometric problems. Geometric problems arise in such fields as image processing, computer vision, graphics, VLSI, spatial planning, and robotics. Topics to be covered include: convex hulls, triangulations, proximity graphs, covering problems, nearest neighbor searching, point inclusion problems, polygonal visibility, extremal polygons, polygon decomposition, distance computations, the diameter of a set, and intersection problems.

CS 650. Computer-Aided Design. Lecture 3 hours; 3 credits. Prerequisites: CS 361, MATH 211 (or 205). Laboratory work required. Theory and application of interactive design systems. Topics include representation and approximation of curves and surfaces, splines and variational properties, tensor product interpolants and Coon's patches.

CS 656. Database Methodology. Lecture 3 hours; 3 credits. Prerequisite: CS 450/550. Laboratory work required. Analysis, design and implementation of databases and database applications using modern software engineering methods. Database CASE tools. Analysis using process, function, and dataflow analysis in conjunction with entity relationship modeling. Database diagrams and database design. Application suite design and high level design of applications. Refining implementations.

CS 657. Applied Logic for Artificial Intelligence. Lecture 3 hours; 3 credits. Prerequisite: CS 480 or 580. Applications of logic. First order predicate calculus as a reasoning agent, deductive reasoning and resolution refutation, nonmonotonic reasoning, induction, reasoning with uncertain information, reasoning about knowledge and belief, meta level

representation and reasoning and architectures for intelligent agents.

CS 660. 3D Computer Graphics. Lecture 3 hours; 3 credits. Prerequisite: CS 460 or 560. Laboratory work required. The mathematical tools needed for the geometrical aspects of 3D computer graphics. Fundamentals: homogeneous coordinates, transformations and perspective. Theory of parametric and implicit curve and surface models: polar forms, Bezier arcs and de Casteljau subdivision, continuity constraints, B-splines, tensor product, and triangular patch surfaces. Representations of solids and conversions among them. Beometric algorithms for graphics problems, with applications to ray tracing, hidden surface elimination, etc.

CS 665. Computer Architecture. Lecture 3 hours; 3 credits. Prerequisite: CS 270. A detailed and quantitative study of the architecture of modern uni-processor computers. The major components are: the technology drivers, performance measures, instruction sets (including 80X86, VAX, and a generic RISC which is very similar to the MIPS series), processor implementation, advanced pipelining and superscalar features, cache and memory design, and I/O. The emphasis is on obtaining quantitative measures of performance, describing interactions of the various components, studying trade-offs between the components in commercial processors, and integration into a complete computer system including interaction of the software and hardware. (offered spring)

CS 667. Internship. 1-3 credits.

CS 669. Practicum. 1-3 credits.

CS 686. Algorithmic Graph Theory. Lecture 3 hours; 3 credits. Prerequisite: CS 600. Investigate a variety of graph algorithms, both sequential and parallel, known to have applications to such areas as scheduling, robotics, computational geometry, VLSI design, and pattern recognition. The students will learn graph algorithms both sequential and parallel in a hybrid environment: the course contains formal lectures along with team projects.

CS 690. Colloquium. Lecture 1 hour; 1 credit. A one-hour weekly lecture given by faculty from Old Dominion and other institutions.

CS 691. Master's Seminar. Seminar 3 hours; 3 credits. Prerequisite: permission of instructor. Graduate seminar presentation concerning technical topics of current interest in computer science.

CS 697. Independent Study in Computer Science. 1-3 credits. Prerequisite: permission of the instructor.

CS 698. Master's Project. 3 credits. Departmental permission required.

CS 699. Thesis Research. 3 credits. Departmental permission required.

CS 710/810. Applied Algorithms. Lecture 3 hours; 3 credits. Prerequisite: CS 600. Laboratory work required. The course will involve solving two or three comprehensive projects anchored in computer science and engineering. Possible topics for projects include: computational issues in network design and analysis; scheduling problems and applications; digital geometry and pattern recognition; image processing and computer vision applications; robotics. The basic thrust is to demonstrate the usefulness and power of algorithm design and analysis in solving real-life problems.

CS 711/811. Software Validation. Lecture 3 hours; 3 credits. Prerequisite: CS 551. Laboratory work required. The most common path to improved confidence in a program is via testing.

This course explores divergent and sometimes conflicting approaches to conducting testing and to measuring the resulting confidence. Topics include the theoretical basis for testing, common testing methods, statistical measures of program reliability, and the relationship between correctness and reliability.

CS 730/830. Complexity Theory and Applications. Lecture 3 hours; 3 credits. Prerequisite: CS 600. Tools to establish that a problem is NP-complete and techniques to cope with NP-completeness. Approximate solutions to NP-complete problems: randomization, local search, along with greedy strategies. Topics include: the classes P and NP, polynomial-time reduction, Cook's theorem and Karp's list of classic problems, proving NP-completeness results, NP-hardness, and coping with NP-completeness.

CS 742/842. Optimization. Lecture 3 hours; 3 credits. Prerequisites: MATH 316 and CS 600. Optimization techniques for discrete and continuous functions are studied. Topics to be covered include simplex method, dual simplex method, cutting plane, branch-and-bound, dynamic programming, genetic algorithms, simulated annealing, penalty function methods and neural nets.

CS 744/844. Performance Evaluation of Computer Systems and Networks. Lecture 3 hours; 3 credits. Prerequisites: CS 450/550 and 471. The course will introduce some of the commonly used techniques in the performance evaluation of computing systems. Students will be exposed to a variety of analytical and simulation tools used in this field. The applicability of the techniques will be illustrated through case studies.

CS 751/851. Introduction to Digital Libraries. Lecture 3 hours; 3 credits. Digital Libraries (DLs) are an increasingly popular research area that encompass more than traditional information retrieval or database methods and techniques. The course will cover a brief history of DL development, with emphasis on World Wide Web implementations. Case studies will be performed on various DLs. The class will focus heavily on project work. At the end of the course, students will be prepared to develop, evaluate, or apply digital library technologies in their work environment. Topics include: Repositories; Distributed Searching; Metadata Harvesting; Preservation, Reference Linking and Citation Analysis.

CS 752/852. Wireless Communications and Mobile Computing. Lecture 3 hours; 3 credits. Prerequisite: CS 555. This course looks at fundamental issues in the area of wireless networks and mobile computing. The course material is organized around the following broad themes: Basics of mobile and wireless communications; Cellular communications: Bandwidth allocation and reservation, Location management, Call admission strategies and QoS issues; Mobile IP and Mobile TCP; Mobile Ad-Hoc NETWORKS (MANET): Routing, Multimedia and QoS support; Sensor networks.

CS 762/862. Real-time Systems. Lecture 3 hours; 3 credits. Prerequisites: CS 471, 450/550 and 455/555. Laboratory work required. Scheduling and resource management to ensure that timing requirements are met, Operating systems for predictable operations in a complex and unpredictable environment with distributed and multiprocessor systems, real-time communication to support real-time traffic in satisfying timing constraints of individual messages, fault tolerance to ensure adequate

reliability and timeliness in spite of failures, and real-time databases to support time-constrained access to data that has temporal validity.

CS 771/871. Advanced Operating Systems. Lecture 3 hours; 3 credits. Prerequisite: CS 471. This course covers principles, design decisions, design techniques, policies, and mechanisms in the design and implementation of general-purpose multiprogramming and distributed operating systems. Topics to be covered include: concurrency, interprocess communication, threads, access control, protection and authentication, multiprocessor operating systems.

CS 772/872. Network Security: Concepts, Protocols and Programming. Lecture 3 hours; 3 credits. Prerequisite: CS 455/555. This course deals with the basic protocols, techniques and programming issues to secure internet applications and traffic. Topics include: Cryptographic algorithms tools and concepts; Secure Socket Layer (SSL), Transport Layer Security (TLS) and IPSec protocols; Securing Internet Applications: HTTP, SMTP, UDP and multicast; Hands on socket programming using C and Java.

CS 775/875. Distributed Systems. Lecture 3 hours; 3 credits. Prerequisites: CS 471, 550 and 555. This course deals with the design issues in distributed computing systems and will discuss the motivation for building distributed systems, various algorithms and protocols proposed in literature for system operability, and some of the experimental distributed systems that have been built in the last few years. Special attention will be paid to the fault-tolerant and performance aspects of these systems. The project component of this course will enable students to get hands-on experience of implementing some of the distributed algorithms.

CS 778/878. Networked Multimedia Systems. Lecture 3 hours; 3 credits. Prerequisites: CS 555 and 576. This course will introduce some of the technical foundations for capturing, transmitting, presentation and storage of continuous multimedia. Students will explore the applications of multimedia and techniques in some areas such as group collaboration and network based education. Topics covered include: Architectures and issues for distributed Multimedia Systems Support for real-time multimedia applications, quality-of-service, synchronization, and presentation of multiple multimedia streams.

CS 779/879. Design of Network Protocols. Lecture 3 hours; 3 credits. Prerequisites: CS 555 and 576. Understanding the design, implementation and performance of network protocols using TCP/IP protocol suite as a case study. The students will have hands-on experience on low-level tools and will access and study the source code of these protocols and writing networking software applications. Topics include: socket interface, IPv4 and IPv6, routing, UDP, multicasting and IGMP, TCP specification, implementation and performance.

CS 786/886. Expert Systems. Lecture 3 hours; 3 credits. Prerequisite: CS 480/580. Expert system approach, knowledge acquisition techniques and representation schemes, inference strategies and explanations, reasoning under uncertainty, inexact reasoning and fuzzy logic, expert system life cycle, design methodology and design examples, expert system implementation tools, managerial and organizational considerations, applications of expert systems.

CS 791/891. Graduate Seminar. 1-3 credits. Prerequisite: permission of the instructor.

CS 795/895, 796/896. Topics in Computer

Science. 1-3 credits. Prerequisite: permission of the instructor.

CS 830. Complexity Theory. Lecture 3 hours; 3 credits. Prerequisite: CS 600. This is an advanced course in the theory of intractability; the classes P, NP are reviewed, then the classes NP-complete, co-NP, NP-hard are studied in detail using the Turing machine model as a basis; examples are chosen from all fields of computer science.

CS 899. Doctoral Dissertation. 1-9 credits. Departmental permission required.

CS 999. Computer Science 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Mathematics and Statistics

Math Pedagogy – MAPD

MAPD 601. Number and Operations for PK-8 Mathematics Specialists. Lecture 3 hours; 3 credits. Prerequisites: MATH 162M, 302, 335. This course will meet the requirements of students in the Master of Science in Education: PK-8 Mathematics Specialist Endorsement Program, and cannot be used for credit toward any degree offered by the Department of Mathematics and Statistics. The course introduces students to a number of topics in PK-8 mathematics and related pedagogical methods. Acknowledging that learning with understanding occurs through a process of establishing a solid knowledge base upon which to build, students will explore the many and varied ways in which PK-8 students may develop number sense. The focus will be upon the development of best practices for teaching mathematics. This requires that the student have knowledge of the content, use a variety of pedagogical approaches, and be able to select and utilize appropriate manipulatives and technological resources that will foster PK-8 student understanding.

MAPD 602. Geometry and Measurement for PK-8 Mathematics Specialists. Lecture 3 hours; 3 credits. Prerequisites: MATH 162M, 302, 335. This course will meet the requirements of students in the Master of Science in Education: PK-8 Mathematics Specialist Endorsement Program, and cannot be used for credit toward any degree offered by the Department of Mathematics and Statistics. The course introduces students to a number of topics in PK-8 mathematics and related pedagogical methods. Following a “concrete-to-abstract” developmental learning approach, students will explore the mathematical concepts of measurement and geometry in grades PK-8. Emphasis will be placed upon measurement and geometry content knowledge as well as the pedagogical knowledge specific to mathematics teaching and learning. Students will also learn to use appropriate technology.

MAPD 603. Rational Numbers and Proportional Reasoning for PK-8 Mathematics Specialists. Lecture 3 hours; 3 credits. Prerequisites: MATH 162M, 302, 335. This course will meet the requirements of students in the Master of Science in Education: PK-8 Mathematics Specialist Endorsement Program, and cannot be used for credit toward any degree offered by the Department of Mathematics and Statistics. The course introduces students to a number of topics in PK-8 mathematics and related pedagogical

methods. It is designed to engage participants in constructing relational understanding between theoretical development of mathematics and students’ learning of mathematics in the content strands of rational numbers and proportional reasoning. Students will learn how to select and use manipulatives to connect the concrete phase of mathematical learning to the abstract, symbolic phase. Various technologies will be integrated throughout the course as tools to enhance teaching and student understanding.

MAPD 604. Probability and Statistics for PK-8 Mathematics Specialists. Lecture 3 hours; 3 credits. Prerequisites: MATH 162M, 302, 335, and STAT 130M. This course will meet the requirements of students in the Master of Science in Education: PK-8 Mathematics Specialist Endorsement Program, and cannot be used for credit toward any degree offered by the Department of Mathematics and Statistics. The course introduces students to a number of topics in PK-8 mathematics and related pedagogical methods. It will focus on the content and processes that support the PK-8 students’ learning of probability and statistics. Instruction will cover data collection, display, and analysis as well as the development of a fundamental understanding of probabilistic structures. These structures will be related to real world problem solving and hands-on activities. Technology will be integrated throughout the course to illustrate mathematical concepts, facilitate students exploration, and to make and test hypotheses.

MAPD 605. Algebra and Functions for PK-8 Mathematics Specialists. Lecture 3 hours; 3 credits. Prerequisites: MATH 162M, 302, 335. This course will meet the requirements of students in the Master of Science in Education: PK-8 Mathematics Specialist Endorsement Program, and cannot be used for credit toward any degree offered by the Department of Mathematics and Statistics. The course introduces students to a number of topics in PK-8 mathematics and related pedagogical methods. It will focus on topics that are encountered by middle and high school students as they move from the particular and concrete thinking of school arithmetic to the abstract thinking associated with algebra. The main themes covered include algebraic reasoning, generalization, and justification together with patterns and functions. Various technologies will be integrated within the course content and used as tools to enhance students’ understanding of the concepts of algebra.

Mathematics — MATH

MATH 400/500. History of Mathematics. Lecture 3 hours; 3 credits. Prerequisite: MATH 311W or 316 or 317. This course considers some of the major events in the development of mathematics from ancient times through the seventeenth century, including the discovery of incommensurability, the origins of the axiomatic method, trigonometry, solution of equations, calculation of areas and volumes, analytic geometry, probability, and calculus. Students will be graded on tests which consist mostly of problems typical of the periods considered.

MATH 401/501. Partial Differential Equations. Lecture 3 hours; 3 credits. Prerequisites: A grade of C or better in MATH 307 and 312. Not available to students with credit in MATH 691. Separation of variable techniques, Sturm-Liouville systems, generalized Fourier series, orthogonal functions of the trigonometric, Legendre and Bessel type boundary value

problems associated with the wave equation and the heat conduction equation in various coordinate systems, applications to physics and engineering.

MATH 404/504. Fundamental Concepts of Geometry. Lecture 3 hours; 3 credits. Prerequisite: MATH 311W. The fundamentals of projective, Euclidean and non-Euclidean geometry are explored by the synthetic method and the algebraic method.

MATH 406/506. Number Theory and Discrete Mathematics. Lecture 3 hours; 3 credits. Prerequisites: MATH 311W and 316. A survey course. Topics include the prime number theorem, congruences, Diophantine equations, continued fractions, quadratic reciprocity, combinatorics, logic, graphs, trees, algorithms, coding and linear programming.

MATH 408/508. Applied Numerical Methods I. Lecture 3 hours; 3 credits. Prerequisites: A grade of C or better in MATH 316. CS 150 or equivalent programming ability also required. An introduction to the numerical methods commonly used by scientists and engineers. Topics include solutions of equations of one variable, direct methods for solving linear systems, matrix factorization, stability analysis, iterative techniques, polynomial interpolation, numerical differentiation and integration, approximation theory, and initial and boundary value problems for ordinary differential equations.

MATH 409/509. Applied Numerical Methods II. Lecture 3 hours; 3 credits. Prerequisites: A grade of C or better in MATH 408/508. Topics include least squares problems, the QR factorization, the conjugate gradient method, Householder transformation and the QR method for approximating eigenvalues and singular values of a matrix. For applications, the finite difference method and the finite element method for solving partial differential equations, trigonometric interpolation and FFT as well as introductory study of optimization are discussed.

MATH 417/517, 418/518. Intermediate Real Analysis I and II. Lecture 3 hours; 3 credits each semester. Prerequisite: A grade of C or better in MATH 317. 417/517 is prerequisite to 418/518. A rigorous course in classical, nonmeasure theoretic, real analysis. Topics include the topology of Euclidean n-space, properties of vector valued functions of several variables such as limits, continuity, differentiability and integrability, pointwise and uniform convergence of sequences and series of functions; Fourier series.

MATH 420/520. Applied Mathematics I: Biomathematics. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in MATH 307. An introduction to current developments in the mathematical investigation of biological problems. Topics include scaling systems of differential equations, stability, perturbation methods, bifurcation phenomena and wave propagation. Applications are chosen from interacting populations, transport and reaction diffusion kinetics, transmission of nerve impulses, and cardiovascular modeling.

MATH 421/521. Applied Mathematics II: Mathematical Modeling. Lecture 3 hours; 3 credits. Prerequisites: A grade of C or better in MATH 307, 312, 316, and 317. A one semester course in formulating, evaluating and validating mathematical models of physical phenomena. Models of traffic flow, mechanical vibrations, combustion, quantum mechanics, wave propagation or other fields of applied mathematics will be examined. Techniques learned in previous courses are used to simplify, analyze and solve

these models. New methods introduced include phase-plane analysis, characteristics, calculus of variations and perturbation methods.

MATH 422/522. Applied Complex Variables. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in MATH 312. Not available to students with credit in MATH 692. Topics include complex numbers, analytical functions and their properties, derivatives, integrals, series representations, residues and conformal mappings. Applications of the calculus of residues and mapping techniques to the solution of boundary value problems in physics and engineering.

MATH 427/527. Applied Mathematics III: Elasticity. Lecture 3 hours; 3 credits. Prerequisites: A grade of C or better in MATH 307 and 312. An introduction to the mathematical theory of linear and non-linear elastic continua. Topics include vectors, tensors, deformation, stress, nonlinear constitutive theory, exact solutions, infinitesimal theory, antiplane strain, plane strain, plane stress, extension, torsion, bending and elastic wave propagation.

MATH 428/528. Applied Mathematics IV: Fluid Mechanics. Lecture 3 hours; 3 credits. Corequisite: MATH 401/501. Prerequisites: A grade of C or better in MATH 307 and 312. A mathematical investigation of the differential equations governing fluid flow with an emphasis on steady state incompressible flows. The Navier-Stokes equations are derived and some exact solutions are presented including the potential flow solutions. Topics therefore include classical ideal fluid flow and its complex variable representation, various approximations to the Navier-Stokes equations, boundary layer theory, and also surface and internal gravity wave motion, aspects of hydrodynamic stability theory and convection. Other topics may be introduced by the instructor.

MATH 457/557. Mathematics in Nature. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in MATH 307. A calculus and differential equations based description of many patterns observable in the natural world including wave motion in the air, oceans, rivers, and puddles; rainbows, halos and other meteorological phenomena; arrangement of leaves, petals and branches; height of trees; river meanders; animal and insect markings; mudcracks; spider webs; and others. Partial differential equations will be discussed as needed but a knowledge of ordinary differential equations will be assumed.

MATH 496/596. Topics in Mathematics. 1-3 credits. Prerequisite: permission of the instructor.

MATH 498/598. Tutorial Work in Special Topics in Mathematics. 1-3 credits. Prerequisite: permission of the instructor. Independent study under the direction of an instructor including library research and reports.

MATH 605. Complex Variables. Lecture 3 hours; 3 credits. Prerequisites: MATH 501, 518 and 522. An advanced course in complex analysis.

MATH 615. Advanced Calculus for Teachers. Lecture 3 hours; recitation 1 hour; 3 credits. Prerequisite: MATH 212. Not available to students with credit in MATH 317. An introduction to real analysis. Topics include the field and order axioms, completeness of the real line, theory of sequences, limits of function, continuity, differentiability, sequences and series of functions, uniform convergence.

MATH 617. Measure and Integration. Lecture 3 hours; 3 credits. Prerequisite: MATH 518. An introduction to measure theory and integration theory with special emphasis on Lebesgue measure and the Lebesgue integral

including Fatou's Lemma, the Monotone Convergence Theorem and the Dominated Convergence Theorem.

MATH 618. Applied Functional Analysis. Lecture 3 hours; 3 credits. Prerequisite: MATH 517. Topics include orthogonal projections to subspaces, duality, the Hahn-Banach theorem and the Banach-Steinhaus theorem, L-2 spaces and convolution operators, fixed point theory, construction of Hilbert spaces, approximation procedures in Hilbert spaces, and spectral theory.

MATH 620. Optimization Techniques. Lecture 3 hours; 3 credits. Prerequisites: MATH 312 and 316. Theory and computational algorithms for the optimization of constrained linear and nonlinear systems or for locating the maximum of a constrained nonlinear function. Applications to problems in economics, operations research and systems theory.

MATH 622. Numerical Solutions to Differential Equations. Lecture 3 hours; 3 credits. Prerequisite: MATH 409/509. An in-depth study of the numerical solution to ordinary and partial differential equations. Topics include linear multi-step methods, Runge-Kutta methods, stiff differential equations, collocation methods, and strong and weak stability analysis for ODEs. For PDEs, finite difference methods are examined.

MATH 632. Master's Project. 3 credits. Prerequisite: permission of graduate program director. Under the guidance of a faculty member in the Department of Mathematics and Statistics, the student will undertake a significant data analysis problem in a scientific setting outside the department. A written report and/or public presentation of results will be required.

MATH 637. Tensor Calculus and Differential Geometry. Lecture 3 hours; 3 credits. Prerequisites: MATH 316 and 517. Topics include metric spaces, bilinear and quadratic forms, tensors, point manifolds, theory of curves, geodesic differentiation, theory of surfaces, curvature of general manifolds, integrability.

MATH 638. Mathematical Theories of Continua. Lecture 3 hours; 3 credits. Prerequisites: MATH 501 and 637. Topics include deformation, motion, stress, conservation laws, and constitutive theories.

MATH 670. Engineering Software for Computer-Aided Analysis and Design. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Introduction to CAE software for finite element modeling and analysis and design optimization. MSC/NASTRAN, PATRAN, PRO/E, GENESIS and other commercially available software will be introduced.

MATH 691. Engineering Analysis I. Lecture 3 hours; 3 credits. Not available to students with credit in MATH 401 or 501. Prerequisites: MATH 307 and 312. Separation of variable techniques, Sturm-Liouville systems, generalized Fourier series, orthogonal functions of the trigonometric, Legendre and Bessel type boundary value problems associated with the wave equation and the heat conduction equation in various coordinate systems, applications to physics and engineering.

MATH 692. Engineering Analysis II. Lecture 3 hours; 3 credits. Not available to students with credit in MATH 422 or 522. Prerequisite: MATH 312. Topics include complex numbers, analytical functions and their properties, derivatives, integrals, series representations, residues and conformal mappings. Applications of the calculus of residues and mapping techniques to the solution of boundary value problems in physics and engineering.

MATH 693. Methods of Applied Mathematics. Lecture 3 hours; 3 credits. Prerequisite: MATH 501 or 691. Advanced topics in the theory and application of ordinary differential equations, distributions, Green's functions, classification of partial differential equations, initial-value problems, eigenfunction expansions for boundary-value problems, selected special functions, singular perturbation theory for differential equations.

MATH 695. Seminar in Mathematics. 1-3 credits. Prerequisite: permission of the instructor.

MATH 696. Topics in Mathematics. 1-3 credits. Prerequisite: permission of the instructor.

MATH 698. Research. 3 credits.

MATH 699. Thesis. 3 credits.

MATH 701/801. Asymptotic and Perturbation Methods. Lecture 3 hours; 3 credits. Prerequisite: MATH 693. Asymptotic and perturbation methods are developed and used to solve linear and nonlinear differential equations. Included are analyses of Duffing's Equation, Van der Pol's Equation, and Mathieu's Equation. Singular perturbation theory and the Method of Matched Asymptotic Expansions are used to solve equations with boundary layer type solutions. Asymptotic expansions of integrals using Laplace's Method, Method of Steepest Descent and Method of Stationary Phase are developed. Applications from all areas of applied mathematics are given.

MATH 702/802. Integral Equations. Lecture 3 hours; 3 credits. Prerequisite: MATH 618, 693. Advanced material in theory and application of integral equations. Formulation of the integral equation problems cause and effect, connection with differential equations, scattering theory, boundary values of partial differential equations, Fredholm and Volterra theory, expansions in orthogonal functions, theory of Hilbert-Schmidt singular integral equations, method of Weiner-Hopf, monotone operator theory, and direct methods.

MATH 703/803-704/804. Advanced Applied Mathematics I & II. Lecture 3 hours; 3 credits each semester. Prerequisite: MATH 702. Advanced techniques of mathematics applied to specific topics of physical interest. Examples could include high activation energy asymptotics applied to combustion, singular integral equations applied to fracture mechanics, or bifurcation theory applied to non-linear phenomena such as transition to turbulence, phase transitions and hydrodynamic stability.

MATH 705/805. Numerical Linear Algebra. Lecture 3 hours; 3 credits. Prerequisite: MATH 409/509. Topics include orthogonal vectors and matrices, norms, singular value decomposition, QR factorization, Gram-Schmidt orthogonalization, least squares problems, condition numbers, stability of backward substitution, stability of least squares algorithm, reduction to Hessenberg or tridiagonal form, and the QR algorithm.

MATH 717/817. Measure and Integration. Lecture 3 hours; 3 credits. Prerequisite: MATH 518. An introduction to measure theory and integration theory with special emphasis on Lebesgue measure and the Lebesgue integral including Fatou's Lemma, the Monotone Convergence Theorem and the Dominated Convergence Theorem.

MATH 720/820. Advanced Applied Functional Analysis. Lecture 3 hours; 3 credits. Prerequisite: MATH 617, 618. In the first half of this course, several concepts in the classical functional analysis are studied. Topics include Banach Spaces, the dual spaces, the Baire category

theorem, the adjoint operator, weak convergence, spectral theory and compact operators. In the second half, under instructor's discretion, special topics are studied. Possible topics include ill-posed problems, inverse scattering theory, the regular Sturm-Liouville problem and the Dirichlet problem for Laplace's equation.

MATH 721/821-722/822. Advanced Applied Numerical Methods I & II. Lecture 3 hours; 3 credits each semester. Prerequisite: MATH 501, 508, 509. Numerical solutions of partial differential equations and integral equations. For PDEs, the finite difference method, the finite element method and the boundary element method are studied. A priori and a posteriori error estimates are examined. For integral equations, topics include Galerkin methods, collocation methods, and the Petrov-Galerkin method.

MATH 723-724/823-824. Approximation and Optimization I & II. Lecture 3 hours; 3 credits each semester. Prerequisite: permission of the graduate program director. Introductory and advanced topics representing current research in approximation and optimization techniques for various application problems. Topics include recent developments in algorithms, their analysis, and applications such as data fitting and pattern separation.

MATH 725/825. Computational Fluid Dynamics and Solid Mechanics. Lecture 3 hours; 3 credits. Prerequisite: MATH 501, 508, 509. An introduction to the theory and methodology of computational fluid dynamics and solid mechanics, with an emphasis on the interplay of the two fields, the study of fluid-structure interactions. Topics will include numerical methods for Navier-Stokes equations, computational techniques for free surfaces, theory of Lagrange multipliers, constraint dynamic problems, fluid-structure coupling problems, differential-algebraic equations, and others.

MATH 745/845. Transform Methods. Lecture 3 hours; 3 credits. Prerequisites: MATH 691 and 692. Use of integral transforms for students of applied mathematics, physics and engineering. Integral transforms studied are Laplace, Fourier, Hankel, finite Z-transforms and other special transforms.

MATH 750/850. Calculus of Variations. Lecture 3 hours; 3 credits. Prerequisites: MATH 691 and 692. Maximum and minimum techniques in calculus and dynamic programming. Derivation of Euler-Lagrange equations for a variety of conditions, formulation of extremum problems with side conditions for ordinary and partial differential equations. Application to dynamics, elasticity, heat and mass transfer, energy principles and finite element techniques.

MATH 755/855. Introduction to Kinetic Theory and Mesoscopic Methods for Computational Mechanics I. Lecture 3 hours; 3 credits. The goal of this course is to provide an introduction to kinetic theory and nonequilibrium statistical mechanics, which bridges the microscopic theories and the macroscopic continuum theories of flows. Topics include the molecular dynamics of N particles, Hamiltonian equation, Liouville equation, Boltzmann equation, binary collision, linearized collision operator and its eigen theory, the H-theorem and irreversibility, calculation of the transport coefficients.

MATH 756/856. Introduction to Kinetic Theory and Mesoscopic Methods for Computational Mechanics II. Lecture 3 hours; 3 credits. Prerequisite: MATH 755/855. This is the second part of the study of the interaction between

kinetic theory and nonequilibrium statistical mechanics. Models of Boltzmann equation and numerical techniques for hydrodynamic equations (Euler and Navier-Stokes equations) and the Boltzmann equation are studied. Topics include Non-normal and moment method, Maxwell's moment method, BGK model equation, gas mixtures and transport phenomena in mixtures, the Wang-Chang-Uhlenbeck equation, Enskog equation for dense gases, the lattice Boltzmann equation for incompressible flows, the gas-kinetic scheme for compressible flows and the Direct Simulation Monte Carlo (DSMC) method.

MATH 795/895. Seminar in Mathematics. 1-3 credits. Prerequisite: permission of the instructor.

MATH 796/896. Topics in Mathematics. 1-3 credits. Prerequisite: permission of the instructor.

MATH 898. Research. 1-9 credits.

MATH 899. Dissertation. 1-9 credits.

MATH 999. Mathematics 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Statistics — STAT

STAT 405/505. Introduction to Data Handling. Lecture 1 hour; laboratory .50 hour; 1 credit. Prerequisite: A grade of C or better in STAT 130M or equivalent, or permission of the instructor. Laboratory work required. Use of SAS or R to bring data sets to a form suitable for statistical analysis. Focus is on the data step and related utilities, including data input, merging of data sets, creating new variables, sorting, printing, charting and formatting. Includes a brief overview of some statistical procedures.

STAT 431/531. Theory of Statistics. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in STAT 331 or departmental permission. Topics include point and interval estimation, tests of hypotheses, introduction to linear models, likelihood techniques, and regression and correlation analysis.

STAT 432/532. Sampling Theory. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in STAT 431/531. Sampling from finite populations is discussed. Topics such as simple random sampling, stratified random sampling and ratio and regression estimation are included. Also discussed are aspects of systematic sampling, cluster sampling, and multi-stage sampling.

STAT 435/535. Design and Analysis of Experiments. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in STAT 330 or 310W-331 or 431/531. Suggested corequisite: STAT 405/505. Topics include experiments with a single factor, multiple comparisons, randomized blocks, Latin squares, incomplete block designs, multifactor factorial experiments, fractional replications, nested designs, experiments to study variance: random and mixed effects, and split plot designs.

STAT 437/537. Applied Regression Analysis. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in STAT 330 or 310W or 431/531. Suggested corequisite: STAT 405/505. Topics include theory of least squares, simple linear regression, multiple regression (including its matrix formulation), applications of these techniques to real life data, residual analysis, selection of variables, multicollinearity issues,

regression on dummy variables, and analysis of covariance.

STAT 440/540. Clinical Trials. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in STAT 431/531. An introduction to statistical methods used in the design, conduct, and analysis of clinical trials. Topics include: study designs, treatment allocation, sample size and power, clinical life tables, log rank test, cross-over designs, and sequential methods of monitoring clinical trials.

STAT 442/542. Environmental Statistics. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in STAT 310W or 330 or permission of the instructor. Topics include basic probability distributions, modeling the number of exceedances using the binomial and Poisson distributions, modeling environmental data using the normal process, environmental monitoring, impact assessment, assessing site reclamation, concept of autocorrelation, diffusion and dispersion of pollutants, distributions with respect to space and time, applications to measuring indoor air quality, water quality, etc. Emphasis will be on the applications of these tools to environmental data using statistical software.

STAT 447/547. Analysis of Longitudinal Data. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in STAT 431/531. Suggested corequisite: STAT 405/505. Topics include general linear models, the weighted least squares (WLS), the maximum likelihood (ML), the restricted maximum likelihood (REML) methods of estimation, analysis of continuous response repeated measures data, parametric models for covariance structure, general estimating equations (GEE) and quasi least squares (QLS), models for discrete longitudinal data: marginal, random effects, and transition models. Limitations of existing approaches will be discussed. Emphasis will be on the application of these tools to data related to the biological and health sciences. Methods will be implemented using statistical software.

STAT 449/549. Nonparametric Statistics. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in STAT 330 or 331 or departmental permission. Topics include the theory and applications of binomial tests and rank tests, including the tests of McNemar, Mann-Whitney, Friedman, Kruskal-Wallis, and Smirnov.

STAT 450/550. Categorical Data Analysis. Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in STAT 431/531. Suggested corequisite: STAT 405/505. Topics include relative risk and odds ratio measures for 2 x 2 tables, the chi-square and Mantel-Haenszel tests, Fisher's exact test, analysis of sets of 2 x 2 tables using Cochran-Mantel-Haenszel methodology, analysis of I x J and sets of I x J tables for both nominal and ordinal data, logistic regression including the logit and probit models, and building and applying loglinear models. Emphasis will be on the application of these statistical tools to data related to the health and social sciences. Interpretation of computer output will be stressed.

STAT 460/560. Statistical Simulation/Programming Using Statistical Software Packages. Lecture 3 hours; 3 credits. Prerequisites: A grade of C or better in STAT 405/505 and two of STAT 435/535, 437/537, 447/547 and 450/550. This course is a data-based tour of advanced statistical techniques using software packages, exploring a catalog of data sets (simulated or otherwise) spanning a variety of fields and applications, including data suitable for

regression, ANOVA, time series modeling, longitudinal data analysis and multivariate techniques. Approaches will include parametric, nonparametric, simulation, and bootstrapping. This is a finishing course for applied statisticians, highly recommended for students planning a career in statistical programming and simulation.

STAT 497/597. Topics in Statistics. 1-3 credits. Prerequisite: permission of the instructor.

STAT 613. Applied Statistical Methods I. Lecture 3 hours; 3 credits. Prerequisite: STAT 130M or 330 or MATH 211 or 226 or permission of instructor. Intended for graduate students in all academic disciplines; not available for credit to graduate students in the Department of Mathematics and Statistics. Topics include descriptive statistics, probability computations, estimation, hypothesis testing, linear regression, analysis of variance and categorical data analysis. Emphasis will be on statistical analysis of data arising in a research setting. The rationale for selecting statistical methods to address research questions will be emphasized. Examples will be given from health sciences, social sciences, engineering, education and other application areas.

STAT 614. Applied Statistical Methods II. Lecture 3 hours; 3 credits. Prerequisite: STAT 613 or equivalent. Intended for graduate students in the health, physical, biological, and social sciences; not available for credit to graduate students in the Department of Mathematics and Statistics. Topics include an in-depth study of regression methods including logistic regression; selected multivariate techniques including MANOVA, principal components analysis, factor analysis and discriminant analysis; and methods of analysis for repeated measurements designs. Emphasis is on statistical computing for solving practical data analysis problems.

STAT 619. Engineering Statistics. Lecture 3 hours; 3 credits. Prerequisite: MATH 212. Elements of probability, probability distributions, sampling, estimation, hypothesis testing, control charts, regression analyses, and analyses of variance.

STAT 625-626. Mathematical Statistics I & II. 625 is prerequisite to 626. Lecture 3 hours; 3 credits each semester. Prerequisite: STAT 310W-331 or 531. An introduction to probability and statistical inference. Topics include probability, conditional probability, Bayes formula, random variables, stochastic independence, expectation, moment generating functions, transformations. Limit theorems and convergence concepts, point and interval estimation, hypothesis testing, correlation and regression analyses, nonparametric statistics, sufficiency, Neyman-Pearson Lemma, and the Cramer-Rao inequality.

STAT 627. Linear Statistical Models. Lecture 3 hours; 3 credits. Prerequisite: STAT 626. Topics include the multivariate normal distribution, distributions of quadratic forms, the general linear model, estimability, the Gauss-Markov theorem and general linear hypotheses, analysis of variance (ANOVA) and covariance (ANCOVA) with special attention to unbalanced data, and analysis of mixed effects and variance components models including repeated measures and split-plot designs.

STAT 628. Applied Multivariate Analysis. Lecture 3 hours; 3 credits. Prerequisite: STAT 537 or 627 or permission of the instructor. Topics include the multivariate normal distribution, graphical display of multivariate data and tests for normality, Hotelling's T^2 , multivariate analysis of variance (MANOVA) and regression, profile analysis, growth curve models, canonical

correlation analysis, principal components, factor models, clustering, and discriminant analysis. All methods are implemented using the SAS statistical software.

STAT 630. Time Series (Box-Jenkins) Models. Lecture 3 hours; 3 credits. Prerequisite: STAT 626. Topics include autocorrelation function, autoregressive and moving average models, nonstationary ARIMA models, forecasting, model identification and estimation, diagnostic checks, and seasonal models. Applications involving real data from air pollution, water pollution, economic indicators and the stock market are also discussed.

STAT 632. Master's Project. 3 credits. Prerequisite: permission of graduate program director. Under the guidance of a faculty member in the Department of Mathematics and Statistics, the student will undertake a significant data analysis problem in a scientific setting outside the department. A written report and/or public presentation of results will be required.

STAT 635. Statistical Consulting. Lecture 1 hour; seminar 2 hours; 3 credits. Prerequisite: STAT 626. This course is intended to teach statistical consulting techniques to graduate students in statistics. Students are expected to work on statistical consulting problems brought by faculty and graduate students in various fields.

STAT 640. Survival Analysis. Lecture 3 hours; 3 credits. Prerequisite: STAT 626. Survival time models, clinical life tables, nonparametric methods for estimating survival functions, Cox regression, survival distributions, mathematical and graphical methods for goodness of fit, proportional hazards models, comparison of treatment groups, regression models.

STAT 667. Cooperative Education. 1-3 credits. Student participation for credit based on academic relevance of the work experience, criteria, and evaluative procedures as formally determined by the department and the cooperative education program prior to the semester in which the work experience is to take place.

STAT 697. Topics in Statistics. 1-3 credits. Prerequisite: permission of the instructor.

STAT 725/825. Advanced Probability. Lecture 3 hours; 3 credits. Prerequisites: MATH 517 and STAT 625. Topics include random variables, independence, modes of convergence, martingales, probability inequalities, law of large numbers, central limit theorems, projections, empirical distributions, extreme order statistics, weak convergence of processes.

STAT 727/827-728/828. Statistical Inference I & II. Lecture 3 hours; 3 credits each semester. Prerequisite: STAT 626. Topics include group and exponential families, sufficiency, unbiasedness, equivariance, properties of estimators, large sample theory, maximum likelihood estimation, EM algorithm, asymptotic optimality, information inequality, decision theory, minimax, admissibility, Bayes estimates, generalized Neyman-Pearson Lemma, uniformly most powerful tests, unbiased tests, invariant tests, and Bayesian tests.

STAT 795/895. Seminar in Statistics. 1-3 credits. Prerequisite: permission of the instructor.

STAT 797/897. Topics in Statistics. 1-3 credits. Prerequisite: permission of the instructor.

STAT 801. Seminar in Statistics I. Lecture 1 hour; 1 credit. Prerequisite: STAT 626 and permission of instructor. Students will read, present, and lead discussion on papers from the current statistical literature. Focus topics will vary by semester.

STAT 802. Seminar in Statistics II. Lecture 1

hour; 1 credit. Prerequisite: STAT 801. Students will read, present, and lead discussion on papers from the current statistical literature. Focus topics will vary by semester.

STAT 803. Seminar in Statistics III. Lecture 1 hour; 1 credit. Prerequisite: STAT 802. Students will read, present, and lead discussion on papers from the current statistical literature. Focus topics will vary by semester.

STAT 898. Research. 1-9 credits.

STAT 899. Dissertation. 1-9 credits.

STAT 999. Statistics 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Ocean, Earth and Atmospheric Sciences — OEAS

OEAS 402/502. Field Experiences in Oceanography for Teachers. Lecture 2 hours; field experience 2 hours; 3 credits. Prerequisite: background in K-12 Education. Field and laboratory experiences in oceanography including hands-on experience using equipment and methods suitable for middle and secondary education professionals. Course will provide understanding of oceanic processes using simple field and laboratory experiments. Not available for credit for OEAS majors.

OEAS 403W/503. Aquatic Pollution. Lecture 3 hours; 3 credits. Prerequisites: at least two semesters of one of the following: BIOL 115N-116N, CHEM 115N-116N, OEAS 111N-112N, PHYS 111N-112N, OEAS 106N-107N or 126N-127N. This course will present basic ecological principles relevant to water pollution and toxicology. Topics will cover runoff, eutrophication, sewage treatment, industrial waste, oil pollution, pesticides, and plastics in the sea. Case studies provide focal points for consideration of issues in making decisions and setting policy.

OEAS 404/504. Environmental Physiology of Marine Animals. Lecture 3 hours; 3 credits. Prerequisite: OEAS 306 or BIOL 331. Functional morphology and physiological aspects of growth and ecological energetics of marine animals. Basic concepts and habitat comparisons.

OEAS 405/505. Physical Oceanography. Lecture 3 hours; 3 credits. Prerequisites: MATH 211 and either PHYS 231N-232N or two semesters of hydraulics. Physics of the ocean: properties of seawater and their distribution; water mass formation; mass and energy flows; waves; tides; models; estuarine and coastal processes. An elective for science and engineering majors.

OEAS 408/508. Introductory Soils. Lecture 3 hours; laboratory 2 hours; 4 credits. Prerequisite: CHEM 115N-116N. Nature and properties of soils. Physical and chemical processes in soils and their influence on plant growth, the movement of water, and pollutants. Importance of soil properties in determining urban, industrial and agricultural uses.

OEAS 410/510. Chemical Oceanography. Lecture 3 hours; laboratory 3 hours; 4 credits. Prerequisites: CHEM 115N-116N, OEAS 306 or consent of instructor. Chemical composition of the ocean and the chemical, biological, geological and physical processes controlling it. Laboratory experiments include determination of salinity, oxygen, and nutrients, and a field sampling trip is undertaken.

OEAS 411/511. Structural Geology. Lecture 3 hours; laboratory 2 hours; 4 credits. Prerequisite: OEAS 320 or permission of instructor. Recognition, habitat, and origin of deformed geologic structures. Relationships between structural patterns and tectonic settings. Laboratory sessions emphasize cartographic and stereographic projections, map interpretation, and hand sample evaluation. Weekend field trip required.

OEAS 412/512. Global Environmental Change. Lecture 3 hours; 3 credits. Prerequisites: OEAS 306 and 310. An examination of the development of the earth as a habitable planet, from its origin to human impacts on global biogeochemical cycles on land, and in the oceans and atmosphere.

OEAS 413/513. Geochemistry. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisites: CHEM 115N-116N and OEAS 313. Low temperature geochemistry of surface and near-surface materials and processes. Weathering and the geochemical cycle as influenced by environment.

OEAS 414/514. Coastal Landscape and Ecology. Lecture 1 hour; laboratory 4 hours; 3 credits. Prerequisites: OEAS 306 and 310. Principles of coastal landscape formation based on classical and modern theories. Geotechnical characteristics and plant habitats at elements of coastal landscapes. Field trips.

OEAS 415/515. Waves and Tides. Lecture 3 hours; 3 credits. Prerequisites: MATH 211-212 and PHYS 231N-232N or permission of the instructor. Causes, nature, measurement and analysis of water waves and tides. Mathematical and graphical application to wave and tide problems.

OEAS 418/518. Chemical Limnology. Lecture 3 hours; 3 credits. Prerequisite: OEAS 306. Chemical cycling in lakes and reservoirs, and interactions with biological and physical processes; quantitative modeling of lake geochemistry.

OEAS 419/519. Spatial Analysis of Coastal Environments. Lecture 1.5 hours; laboratory 3 hours; 3 credits. Prerequisites: OEAS 414/514 and GEOG 404/504. The course integrates remotely sensed and field techniques for scientific investigation and practical management of coastal environmental systems. Spatial modeling of coastal processes and management tools using geographic information system (GIS).

OEAS 420/520. Hydrogeology. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisites: OEAS 320, MATH 211, PHYS 111N-112N or 231N-232N, or permission of the instructor. Topics covered will include the occurrence and movement of surface and subsurface water, the nature and distribution of permeable rocks and strata, field techniques used in ground-water studies, and the flow of ground-water to wells.

OEAS 426/526. Concepts in Oceanography for Teachers. 3 credits. Prerequisite: junior standing or permission of the instructor. This web-based course will provide a practical introduction to oceanography for earth science teachers. It is particularly aimed at current science teachers attempting to become certified in earth science education. Topics will include discussions of geological, biological, physical and chemical oceanography. Not available for credit for OEAS majors.

OEAS 430/530. Introduction to Geophysics. Lecture 3 hours; 3 credits. Prerequisites: OEAS 111N, MATH 211, and PHYS 111N/112N or 231N/232N. Pre- or corequisite: PHYS 112N or 232N. Introduction to the physics of the earth,

including plate tectonics, volcanism, earthquakes and seismology, gravity, the earth's magnetic field, geophysical remote sensing, and mantle convection.

OEAS 431/531. Sedimentary Petrology. Lecture 2 hours; laboratory 3 hours; 3 credits. Prerequisite: OEAS 320. The chemical aspects of sediments and sedimentary rock needed for modern geologic and oceanographic studies. Optical petrology and x-ray diffraction are emphasized in the laboratory with particular attention to clay mineralogy. Field trip required.

OEAS 434/534. Introduction to Geophysical Methods in Geology. Lecture 2 hours; laboratory 2 hours; 3 credits. Prerequisites: OEAS 110N or 111N, and PHYS 111N-112N, or permission of the instructor. Discussion on geophysical methods and results, including seismology, gravity, geomagnetism, geoelectricity, and radiometrics. Laboratory includes problem assignments and a few field experiments using geophysical instruments. Part of the laboratory hours will be used for lecturing.

OEAS 436/536. Barrier Islands and Coastal Lagoons. Lecture 1.5 hours; laboratory 3 hours; 3 credits. Prerequisite: OEAS 414/514. Elementary principles of landscape, hydrography and ecology at coastal lagoons and barrier islands. Field trips to wave and tide dominated systems.

OEAS 440/540. Biological Oceanography. Lecture 3 hours; laboratory 2 hours; 4 credits. Prerequisites: OEAS 106N-107N, 126N-127N or 306. Marine organisms and their relationship to physical and chemical processes in the ocean. Laboratory study of local marine organisms, marine ecosystem and sampling techniques. Includes identification, data analysis and field trips.

OEAS 446/546. Quaternary Geology. Lecture 3 hours; 3 credits. Prerequisite: OEAS 344W. Geological effects of Cenozoic climate changes and tectonic movements on marine and terrestrial systems. Weekend field trips to study landscapes and deposits in the coastal plain and Appalachian provinces.

OEAS 448/548. Population Ecology. Lecture 3 hours; 3 credits. Prerequisite: MATH 211. This course uses conceptual and mathematical models to understand how populations grow and persist in space and time. Both plants and animals are discussed.

OEAS 455/555. Introduction into Geomicrobiology. Lecture 3 hours; 3 credits. Prerequisite: OEAS 303. This course explores microorganisms in marine environments and their role in the fossil record. Students elucidate especially bacteria and protista and investigate Earth's history during the Precambrian. One field trip.

OEAS 487, 488. Honors Research in Ocean and Earth Sciences. Independent studies and scheduled meetings with faculty advisor; 1-3 credits each semester. Prerequisite: senior standing and admission to the Academic Honors Program. Supervised study in a field of individual interest. Research results are reported in a public oral presentation and a thesis.

OEAS 495/595. Special Topics. Lectures, field and laboratory studies; 1-4 credits each semester. Prerequisites: junior standing and permission of the instructor. An investigation of a selected problem in physical, geological, chemical, or biological oceanography.

OEAS 603. Geobiology and Biosedimentology. Lecture 3 hours; 3 credits. Geobiology and biosedimentology reflect the

interdisciplinary approach to environmental problems, questions related to Earth history, and the exploration of extraterrestrial worlds. The course elaborates our understanding of geobiology and biosedimentology by conducting a study on benthic cyanobacteria and their influences on sedimentary processes in marine environments. Study area is Fisherman's Island, located close to Norfolk, VA. The course includes aspects of astrobiology (the "sister of geobiology"), and discusses the evolution of life on Earth.

OEAS 604. Introduction to Physical Oceanography. Lecture 3 hours; 3 credits. Introduction to descriptive and dynamical physical oceanography. Properties of sea water; distribution of temperature, salinity and density; water, salt, and heat budgets; techniques for describing the ocean; circulation and water masses of the world's oceans and coastal waters.

OEAS 606. Experimental Procedures in Physical Oceanography. Lecture 3 hours; 3 credits. Provides basic knowledge for conducting field experiments in physical oceanography. Fundamentals of experimental design and sampling theory. Standard methods of data reduction, analysis, and reporting.

OEAS 610. Advanced Chemical Oceanography. Lecture 3 hours; 3 credits. Chemical properties of seawater; chemical composition of the ocean including major and trace elements, dissolved gases, micronutrient elements, and organic compounds; processes controlling this composition.

OEAS 611. Chemical Oceanography Laboratory. Laboratory 6 hours; 3 credits. Basic analytical chemistry of seawater; field work in chemical oceanography.

OEAS 612. Marine Geochemistry. Lecture 3 hours; 3 credits. Prerequisite: OEAS 610. Processes governing the chemical composition of the ocean. Riverine input; air-sea exchange; sediment-bottom water exchange; hydrothermal input; internal cycling by physical processes; numerical modeling in chemical oceanography.

OEAS 613. Geochemistry of Marine Sediments. Lecture 3 hours; 3 credits. Prerequisites: OEAS 610, 612. An introduction to the geochemistry of marine sediments, with an emphasis on nutrient (C,N,P,S) and trace element cycling in marine sediments.

OEAS 614. Chemical Oceanography in the Coastal Environment. Lecture 3 hours; 3 credits. Prerequisite: OEAS 610. Chemical dynamics within water and sediments of estuaries, salt marshes, and the continental shelf; river-sea, air-sea, and sediment-water interactions; modeling techniques.

OEAS 616. Advanced Chemical Oceanography Laboratory. Lecture 1 hour; laboratory 6 hours; 3 credits. Prerequisite: OEAS 611. Analysis of trace constituents in marine waters, sediments, and sediment porewaters; sampling techniques; field experience.

OEAS 617. Applied Geochemistry. Lecture 3 hours; 3 credits. Soil and contaminant properties, soil-water interaction, soil permeability, contaminant-soil interactions, water and contaminant attenuation and movement in unsaturated zone of inorganic and organic contaminants are discussed.

OEAS 620. Advanced Geological Sciences. Lecture 3 hours; 3 credits. Survey of marine and terrestrial geology and geophysics; plate tectonics and basin formation; marine sediments and sediment dynamics; marine depositional environments and depositional systems; marine

stratigraphy dynamics and the formation of marine basins.

OEAS 622. Wetland Hydrology. Lecture 2 hours; laboratory 3 hours; 3 credits. Hydrologic criteria used to delineate wetlands. Techniques used to calculate components of water budgets for non-tidal wetlands. Many lab exercises will require extensive field work in wetlands.

OEAS 625. Sediments and Sediment Dynamics. Lecture 3 hours; 3 credits. Prerequisite: OEAS 620. Attributes of marine sediments; boundary layer fluid dynamics and sediment transport; characteristics of cohesive and noncohesive sediments; gravity transport; grain size frequency distributions, strata formation and biotic reworking of sediments.

OEAS 628. Depositional Systems. Lecture 3 hours; 3 credits. Prerequisite: OEAS 620. Marine depositional environments, facies assemblages and the morphodynamics of their formation; numerical models of sediment accumulation.

OEAS 630. Dynamical Oceanography I. Lecture 3 hours; 3 credits. Prerequisites: OEAS 604 and MATH 691. Dynamics of rotating, stratified fluids, geostrophic adjustment, potential vorticity, Ekman layers, gravity waves, and large scale ocean circulation.

OEAS 634. Applied Clay Mineralogy. Lecture 3 hours; 3 credits. The study of clay minerals and colloids and the application of their physical and chemical properties to various geologic, agricultural, and environmental problems. Special emphasis is given to ion exchange and sorption problems involving clays under various conditions. Techniques of semiquantitative analysis of clay minerals and the alteration of their chemical physical properties are emphasized.

OEAS 640. Advanced Biological Oceanography. Lecture 3 hours; 3 credits. Marine organisms and their interactions with the physical and chemical environments of the sea; primary production, population ecology, nutrition, reproduction, and marine biogeography.

OEAS 644. Environmental Physiology of Marine Animals. Lecture 3 hours; 3 credits. Prerequisite: OEAS 640 or equivalent. Physiological and biochemical adaptations of marine animals in stable and changing environments. Topics include foraging, respiration growth and reproductive strategies in diverse marine habitats.

OEAS 651. Introduction to Physics of Estuaries. Lecture 3 hours; 3 credits. Prerequisite: OEAS 604. This course considers the physical oceanography of estuaries. In particular, it explores how circulation and mixing in estuaries are influenced by atmospheric forcing, tidal forcing, coastal influences and bathymetric variability. Topics to be treated include classification of estuaries, typical steady dynamical balances, transport of salt and other quantities, mixing, and time-space scales of variability.

OEAS 657. Geological Aspects of Hazardous Waste Management. Lecture 3 hours; 3 credits. Waste characterization including classification, source and types of wastes and waste management. Major disposal methods (landfills, land disposal, underground injection and geologic repositories) that affect geologic materials and ground water are discussed.

OEAS 667. Cooperative Education. 1-3 credits (may be repeated for credit). Prerequisite: approval by the department and Career Management in accordance with the policy for granting credit for Cooperative Education

programs. Available for pass/fail grading only. Student participation for credit based on the academic relevance of the work experience, criteria, and evaluative procedures as formally determined by the department and Career Management prior to the semester in which the work experience is to take place.

OEAS 669. Internship in Oceanography. 1-3 credits. Prerequisite: permission of the department.

OEAS 690. Topics in Marine Environmental Policy. Lecture 3 hours; 3 credits. This course will give students a working understanding of how science policy decisions are made by governments and how science and technology impact public policy. This course seeks to integrate current policy/legislative initiatives with the underlying scientific issues in order to raise the student's appreciation for and understanding of the various influences that affect the decision-making process. In particular, the course will look at how science influences policy and assess the "state of the science" relative to the issues at stake.

OEAS 691. Seminar. One semester required; 1 credit. Techniques for presenting scientific data at professional meetings and seminars. Practical experience and feedback.

OEAS 695. Special Topics in Oceanography. 1-3 credits each semester. An advanced investigation in a selected problem in physical, geological, chemical, or biological oceanography under the direction of the faculty of the Department of Ocean, Earth and Atmospheric Sciences.

OEAS 696. Selected Topics. 1-3 credits. Prerequisite: permission of the instructor.

OEAS 698. Research. Any semester; hours to be arranged; variable credit. 1-9 credits per semester. M.S.-level research.

OEAS 699. Thesis. Any semester; hours to be arranged; variable credit. 1-9 credits per semester. M.S.-level work primarily devoted to the writing of the thesis.

OEAS 703/803. Stability of Ocean Flow. Lecture 3 hours; 3 credits. Prerequisites: calculus, differential equations, geo-physical fluid dynamics. A study of the basic ideas and methods used to examine the stability of ocean currents. Topics include fundamentals, barotropic and baroclinic instability, wave packets and energy balance.

OEAS 704/804. Time Series in Oceanography. Lecture 3 hours; 3 credits. Prerequisite: calculus. A study of the basic techniques used to model and analyze time series of oceanographic data. These include temporal spatial and frequency/wave number domain techniques.

OEAS 708/808. Simulation Techniques for Ocean Circulation. Lecture 3 hours; 3 credits. Prerequisites: OEAS 604, 630 and 730, and knowledge of a computer program language (FORTRAN preferred). Emphasis is on the construction of working ocean models, both vorticity-stream function and primitive equation models analyzed, mostly finite difference techniques, implicit and explicit schemes, staggered grids, discussion of ocean general circulation models.

OEAS 711/811. Regional Oceanography. Lecture 3 hours; 3 credits. Prerequisite: OEAS 604. The regional oceanography of the major ocean basins, marginal seas, and coastal oceans. Seasonal and interannual variability. Heat and salt cycles.

OEAS 712/812. Radiogeochemistry of the Ocean. Lecture 3 hours; 3 credits. Prerequisites:

OEAS 610 and 612. Sources of radioactivity in the oceans; marine geochemistry of radioactive nuclides; tracking marine processes with radioactive nuclides.

OEAS 723/823. Ocean Turbulence and Mixing Processes. Lecture 3 hours; 3 credits. Prerequisites: OEAS 630 and 730/830. This course will first provide a broad background in the concepts, theories and semi-analytical techniques used to describe turbulent motions and their effects in fluids. The various observational techniques that are presently used to measure turbulence in the ocean will be explored

OEAS 730/830. Dynamical Oceanography II. Lecture 3 hours; 3 credits. Prerequisite: OEAS 630. Dynamics of rotating stratified fluids. Inertial waves, equatorial dynamics, coastal dynamics, dynamic instability.

OEAS 732/832. Advanced Geochemistry of Marine Sediments. Lecture 3 hours; 3 credits. Prerequisites: OEAS 610, 612, 613. Advanced topics in the geochemistry of marine sediments, with an emphasis on mathematical modeling of sedimentary geochemical processes.

OEAS 735. Paleoclimatology. Lecture 3 hours; 3 credits. Prerequisites: OEAS 604, 610, 620. This course focuses on the causes (forcings) of climate change; natural response time of the climate system; interactions and feedbacks; and the geologic record in climate change.

OEAS 741/841. Fisheries Science. Lecture 4 hours; 4 credits. An introduction to the major questions in the management of marine fisheries: abundance, estimation, distribution, recruitment and optimum yield. Topics are presented within the context of fisheries management, marine productivity and population ecology, all of which shape the direction of the primary literature.

OEAS 743/843. Applied Methods of Fisheries. Lecture 2 hours; laboratory 4 hours; 4 credits. Prerequisite: OEAS 744/844. Practice, principles and theory of applied methods in fisheries. Sampling and data collection tools, practice, and theory. Principles and theory of age determination, estimation of abundance, reproductive biology, marking and tagging, and mark-recapture. Special topics as necessary.

OEAS 744/844. Fisheries Management. Lecture 3 hours; 3 credits. Quantitative methods for the description and management of fisheries. Analytical and empirical forecasting models used to study case histories of managed fish stocks. Case studies of poorly and well managed stocks.

OEAS 747/847. Reproduction and Larval Ecology of Marine Invertebrates. Lecture 3 hours; 3 credits. Prerequisite: OEAS 640. Topics include the evolution of reproductive strategies, maturation, behavior, larval ecology, and recruitment.

OEAS 750/850. Dynamics of Large Scale Ocean Circulation. Lecture 3 hours; 3 credits. Prerequisites: OEAS 604, 630 and 730. Quasi-geostrophic beta-plane dynamics, wind driven circulation, thermohaline circulation, effects of bathymetry, quasi-geostrophic waves, effects of mesoscale eddies, layered models with outcrops and ventilation.

OEAS 755/855. Mathematical Modeling of Marine Ecosystems. Lecture 3 hours; 3 credits. Prerequisites: calculus, differential equations, OEAS 604 and 640. This course is focused on the theory and techniques of mathematical model development for marine ecosystems. The course is designed to provide an understanding of how to parameterize interaction among components of marine food webs and interaction of food web

components with physical environments.

OEAS 760/860. Microbial Ecology of Marine Benthic Environments. Lecture 3 hours; 3 credits. Prerequisite: OEAS 640. The course emphasizes the role of microorganisms in the transfer and cycling of energy and matter on centimeter to global scales. Lectures cover microbiological organisms, processes, and methods in benthic regimes ranging from the intertidal to the deep sea, in hydrothermal and coldwater vents, and in hydrocarbon seeps.

OEAS 764/864. Coastal Sedimentology. Lecture 2 hours; laboratory 2 hours; 3 credits. Sedimentary processes in different coastal zones will be described: carbonate, evaporitic, and clastic depositional systems. We will conduct a small research project along the coast of Virginia. Field trip required.

OEAS 765/865. Marine Biogeochemistry. Lecture 3 hours; 3 credits. Prerequisites: OEAS 610, 640. This class will focus on biologically mediated elemental cycling in aquatic systems. Assimilatory and dissimilatory biological processes involving auto- and heterotrophic organisms frequently mediate elemental cycling of these elements. Inorganic compounds and dissolved and particulate organic material will be discussed in terms of their biological reactivity and turnover times in aquatic systems and their contribution to elemental cycling on a variety of temporal and spatial scales. Also included is the issue of how community structure and function alter biogeochemical cycles.

OEAS 770/870. Aquatic Photosynthesis. Lecture 3 hours; laboratory 3 hours; 4 credits. This course examines the physics, chemistry, biology and ecology of photosynthesis by aquatic organisms. Topics include light harvesting, energy transfer, carbon metabolism and biosynthesis and their ecological consequences.

OEAS 772/872. Aquatic Optics. Lecture 3 hours; laboratory 3 hours; 4 credits. The course covers the physics of light transmission through the aquatic medium as affected by scattering and absorption, the optical properties of seawater, suspended particles of living cells, underwater vision and ocean color.

OEAS 795/895. Advanced Topics in Oceanography. 1-3 credits each semester. An advanced investigation of a selected problem in physical, geological, chemical, or biological oceanography under the direction of the faculty of the Department of Ocean, Earth and Atmospheric Sciences.

OEAS 800. Survival Skills for Scientists. Seminar 1 credit, P/F. Seminar class each fall and spring that will address a series of topics to improve student success as scientists.

OEAS 840. Plankton Dynamics. Lecture 3 hours; 3 credits. Prerequisite: OEAS 640. This course emphasizes the ecology of heterotrophic plankton from bacteria to protists, from metazoan invertebrate plankton to fish larvae. Students will explore the role of plankton groups and species in the context of pelagic ecosystems. Planktonic processes are not only relevant for the ocean ecosystem but also for fisheries, aquaculture, environmental and human health, and global climate. The course consists of lectures, discussion groups on selected reading material, and laboratory demonstrations.

OEAS 869. Internship in Oceanography. 1-3 credits. Prerequisite: permission of the department.

OEAS 898. Doctoral Research. Any semester; hours to be arranged; variable credit, 1-9

credits per semester. Ph.D.-level research.

OEAS 899. Dissertation. Any semester; hours to be arranged; variable credit, 1-9 credits per semester. Ph.D.-level work primarily devoted to the writing of the dissertation.

OEAS 999. Ocean, Earth and Atmospheric Sciences. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Physics — PHYS

Those courses with a + after the number cannot be counted toward the M.S. (Physics) or Ph.D. in Physics degrees.

PHYS 406/506. Observational Astronomy. Lecture 3 hours; 3 credits. Prerequisite: junior standing. Observational techniques in astronomy with emphasis on constellation identification, celestial movements, and telescopic observation. Individualized night observations are required.

PHYS 408/508+. Astronomy for Teachers. Lecture 3 hours; 3 credits. Prerequisite: junior standing. A course in astronomy dealing with stars and stellar systems. Topics will include observational astronomy, the electromagnetic spectrum, relativity, stellar and galactic structures, cosmology, and the search for extraterrestrial intelligence.

PHYS 413W/513. Methods of Experimental Physics. Laboratory 6 hours; 3 credits. Prerequisites: PHYS 303 and 323. Corequisite: CS 150. Experiments in classical and modern physics, designed to develop skills in the collection, analysis, and interpretation of experimental data. (offered spring)

PHYS 414/514. Principles of Physical Instrumentation. Laboratory 6 hours; 3 credits. Prerequisite: PHYS 413W. Methods for design of experiments using modern physical instrumentation. Included are topics such as analog and digital data acquisition, materials science, vacuum technology, cryogenics measurement techniques, and error and data analysis.

PHYS 416/516. Introduction to Solid State Physics. Lecture 3 hours; 3 credits. Prerequisites: PHYS 352 and MATH 307. Introduction to solid state physics and materials science, with emphasis placed on the applications of each topic to experimental and analytical techniques. Topics include crystallography, thermal and vibrational properties of crystals and semiconductors, metals and the band theory of solids, superconductivity and the magnetic properties of materials.

PHYS 417/517. Introduction to Particle Accelerator Physics. Lecture 3 hours; 3 credits. Prerequisites: PHYS 319 or ME 205, and PHYS 320 or ECE 323. Introduction to the historical development and applications of particle accelerators to the fields of nuclear physics, particle physics, material sciences, and medical therapy and the design and physics of particle accelerators. Aspects of linear accelerators, circular accelerators such as cyclotrons, betatrons, synchrotrons, and storage rings, and recirculated linacs are covered. Topics include linear and non-linear single particle motion in accelerators, collective effects and beam stability in particle accelerators, and the electromagnetic radiation emitted by relativistic particles in accelerators. Up to date descriptions of the most modern particle accelerators will be included, as well as

applications such as fixed target nuclear physics arrangements, colliding beam accelerators for high energy physics research, advanced storage ring sources of X-Rays, advanced neutron sources, radiation and radioactive material sources, and cancer therapy devices.

PHYS 420/520. Introductory Computational Physics. Lecture 2 hours; Laboratory 2 hours; 3 credits. Prerequisites: PHYS 232N and MATH 212. Introduction of computational methods and visualization techniques for problem solving in physics.

PHYS 451/551. Theoretical Mechanics. Lecture 3 hours; 3 credits. Prerequisites: PHYS 319 and MATH 312. A mathematical study of the concepts of mechanics. Vector calculus methods are used. Topics include mechanics of a system of particles, Lagrangian mechanics, Hamilton's canonical equations, and motion of a rigid body.

PHYS 453/553. Electromagnetic Radiation and Optics. Lecture 3 hours; 3 credits. Prerequisites: PHYS 320 or ECE 323 and MATH 312. A course in electrodynamics developed from Maxwell's Equations. Topics include Maxwell's Equations, Conservation Laws, Electromagnetic Waves, Potentials and Fields, Radiation, and the interplay of electrodynamics and special relativity. (offered fall)

PHYS 454/554. Thermal and Statistical Physics. Lecture 3 hours; 3 credits. Prerequisites: PHYS 319 and 323. A study of the fundamental concepts of thermodynamics, kinetic theory, and statistical mechanics. Topics include the thermodynamics of simple systems, kinetic theory of gases, statistical mechanics of gases and an introduction to quantum statistics. (offered spring)

PHYS 456/556. Intermediate Quantum Mechanics. Lecture 3 hours; 3 credits. Prerequisites: PHYS 323 and 352 or permission of the instructor. A study of the experimental basis of quantum mechanics, basic postulates, solution of the wave equation for simple systems, uncertainty relations, potential barriers, wave packets, angular momentum, symmetry properties of wave functions, Pauli exclusion principle, Dirac notation, perturbation theory, and scattering. (offered fall)

PHYS 497/597. Special Problems and Research. 1-3 credits each semester. Prerequisite: senior standing or permission of the instructor. These courses afford the student an opportunity to pursue individual study and research.

PHYS 601. Mathematical Methods of Physics I. Lecture 3 hours; 3 credits. Mathematical methods and applications necessary for work in theoretical physics.

PHYS 603. Classical Mechanics. Lecture 3 hours; 3 credits. Particle and rigid body mechanics. Lagrangian and Hamiltonian formulation, Canonical transformation, Hamiltonian-Jacobi theory.

PHYS 604. Electromagnetic Theory I. Lecture 3 hours; 3 credits. Development of the classical theory of electromagnetism.

PHYS 621. Quantum Mechanics I. Lecture 3 hours; 3 credits. Prerequisite: PHYS 556. Rigorous development of the quantum theory, perturbation problems and scattering theory.

PHYS 636. Astrophysics. Lecture 3 hours; 3 credits. Prerequisite: PHYS 556. Theory of radiative equilibrium of stars, formation of stellar spectra, the physics of stellar atmosphere, the internal structure of stars and stellar evolution.

PHYS 695. Selected Topics in Pure and Applied Physics. 1-3 credits. Prerequisite: permission of the instructor.

PHYS 696. Individual Study and Methods of Research. 3 credits. Prerequisite: permission of the instructor. Introduction to methods of research through guided individual study of one or more advanced problems.

PHYS 697. Seminar. 1 credit.

PHYS 698. Research. 3 credits. Master's thesis.

PHYS 699. Research. 3 credits.

PHYS 701/801. Mathematical Methods of Physics II. Lecture 3 hours; 3 credits. Prerequisite: PHYS 601. Further mathematical methods and applications used in theoretical physics.

PHYS 704/804. Electromagnetic Theory II. Lecture 3 hours; 3 credits. Prerequisite: PHYS 604. Further development of the classical theory of electromagnetism.

PHYS 707/807. Statistical Mechanics. Lecture 3 hours; 3 credits. Prerequisites: PHYS 554 and 603. Topics in classical and quantum statistical mechanics.

PHYS 709/809. Applied Physics Laboratory. Laboratory 6 hours; 3 credits. Experimental techniques encountered in research activities such as a study of various transducers used in laser, optical, plasma and nuclear physics.

PHYS 711/811. Computational Physics. Lecture 3 hours; 3 credits. Studies of high level computer languages. Computational techniques used in physics. Numerical techniques for differential and integral problems. Algebraic processing languages. Introduction to scientific visualization techniques.

PHYS 712/812. Applied Physics. Lecture 3 hours; 3 credits. Lectures on contemporary problems in applied physics.

PHYS 721/821. Quantum Mechanics II. Lecture 3 hours; 3 credits. Prerequisite: PHYS 621. Hilbert space formulation of quantum mechanics; stationary and time dependent perturbation theory; variational methods; spin; many-particle systems. Boson and Fermi particles.

PHYS 722/822. Nuclear Physics. Lecture 3 hours; 3 credits. Prerequisite: PHYS 621. Nuclear force, models of nuclear structure and reactions. Intermediate energy hadron and lepton scattering.

PHYS 723/823. Introduction to Particle Physics. Lecture 3 hours; 3 credits. Prerequisite: PHYS 722/822. Introduction to hadron spectroscopy and the parton model. Discrete and continuous symmetries and application to particle physics. Introduction to the quark model and application to static properties. Klein-Gordon and Dirac equations, quantum electrodynamics and Feynman rules applied to weak interactions, the parton model and deep inelastic scattering.

PHYS 724/824. Solid State Physics I. Lecture 3 hours; 3 credits. Prerequisite: PHYS 621. Theoretical study of atomic and nuclear spectroscopy with emphasis on hyperfine interactions in solids. Superconductivity, magnetism and the magnetic properties of materials. Introduction to x-ray, electron and neutron diffraction techniques.

PHYS 727/827. Atomic Physics. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Irreducible tensor methods. Radiative excitation and ionization processes. Atom-atom scattering. Time-evolution of atomic observables in external fields. Multiple channel quantum defect theory and complex atomic and molecular spectra.

PHYS 731/831. Advanced Seminar I. Lecture 1 hour; 1 credit. Written and oral communication skills as applied to physics. Data

display techniques for scientific reports.

PHYS 732/832. Advanced Seminar II. Lecture 1 hour; 1 credit. Methodology of scientific information retrieval. Organization of information in selected research areas.

PHYS 733/833. Seminar in Applied Physics. Lecture 1 hour; 1 credit. Report and proposal writing including the submission by the student of a proposal for the Ph.D. dissertation.

PHYS 737/837. Surface Physics. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Introduction to the nature and properties of solid surfaces, liquid and gas interactions with surfaces, physical absorption and chemical absorption.

PHYS 750/850. Quantum Electronics. Lecture 3 hours; 3 credits. Prerequisites: PHYS 604 and 621. Theoretical development of the quantization of the electromagnetic field and the interaction of fields with matter. Photon coherence, general theory of the laser and topics in nonlinear optics are developed. Applications are selected from topics of current research interest.

PHYS 760/860. Low Temperature Physics. Lecture 3 hours; 3 credits. Prerequisite: Physics 454/554, 604, 721/821. This course is an introduction to low temperature physics and in particular, to macroscopic quantum phenomena in condensates: superfluidity and superconductivity. The aim of this course is to provide an introduction to the physics of condensates at low temperatures. This course is intended for students with a wide range of interests: condensed matter physics (theoretical and experimental), applied and accelerator physics. The connection between superfluidity, superconductivity, and particle accelerators will be emphasized.

PHYS 763/863. Plasma Physics. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Development of plasma theory, including collision processes, orbit theory, hydrodynamic theory and solar relationships.

PHYS 797. Research. 1-6 credits each semester.

PHYS 825. Solid State Physics II. Lecture 3 hours; 3 credits. Prerequisite: PHYS 724/824. Phonons, plasmons, magnons, and polarons; introduction to many body techniques; superconductivity; Bloch functions, Brillouin zones, electron dynamics; energy bands and Fermi surfaces; correlation functions and neutron diffraction.

PHYS 841. Many-Body Physics. Lecture 3 hours; 3 credits. Prerequisites: PHYS 621, 704/804, 707/807. Review of second quantization and statistical mechanics. The Green's function method of perturbation theory at zero and finite temperatures for fermion and boson systems. Selected applications in nuclear and condensed matter physics.

PHYS 842. Advanced Quantum Mechanics. Lecture 3 hours; 3 credits. Prerequisites: PHYS 603, 704, 721. Introduction to relativistic quantum mechanics; symmetries in relativistic wave equations; solutions to relativistic wave equations for bound states and scattering processes; classical field theory and role of symmetries in construction of conserved currents; introduction to second quantization of fields.

Advanced Topics Courses. Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. These courses provide students with knowledge of methods and background necessary for pursuit of research. Subject matter is variable.

PHYS 851-852. Solid State Physics.

PHYS 853-854. Atomic & Molecular Physics.

PHYS 857-858. Plasma Physics.

PHYS 859-860. Applied Physics.

PHYS 861-862. Nuclear Physics.

PHYS 863-864. Particle Physics.

PHYS 865. Many-Body Physics.

PHYS 871-872. Quantum Field Theory.

PHYS 890. Hadron Physics with Chromodynamics. Lecture 3 hours; 3 credits. Prerequisite: at least introductory courses in elementary particle phenomenology and field theory. This course describes the constituent quark model picture of hadronic structure and its conceptual basis. It begins with a general introduction to QCD, approaching the confinement regime via a Hamiltonian lattice formulation of the theory. The course will close with a discussion of some implications of the constituent quark model for the NN interaction.

PHYS 898. Doctoral Research. Credit varies, 1-12 credits each semester.

PHYS 899. Dissertation. Credit varies, 1-9 credits.

PHYS 999. Physics 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Psychology — PSYC

PSYC 405/505. Abnormal Psychology. Lecture 3 hours; 3 credits. Prerequisite: PSYC 201S. A study of psychopathology, covering various behavior disorders, their descriptions, characteristics, and causation. Methods of therapeutic technique are reviewed.

PSYC 408/508. Theories of Personality. Lecture 3 hours; 3 credits. Prerequisite: PSYC 201S. A study of the structure of personality and the dimensions along which individuals differ. The contributions of major personality theorists and the implications of current research are considered.

PSYC 412/512. Psychological Tests. Lecture 3 hours; 3 credits. Prerequisite: PSYC 201S. An examination of the history, theory and applications of psychological testing.

PSYC 420/520. Cross-Cultural Psychology. Lecture 3 hours; 3 credits. Prerequisite: junior standing or permission of instructor. A wide variety of psychological research and theory relevant to human behavior in different cultures is examined and the impact of culture on human behavior is discussed. The course examines cross-cultural research conducted by scholars around the world. In addition to factual knowledge, emphasis is placed on critical thinking and problem solving.

PSYC 431/531. Community Psychology. Lecture 3 hours; 3 credits. Prerequisite: PSYC 201S or permission of the instructor. This course focuses on behavioral prevention and intervention efforts targeting social problems. The goal is to understand how to design and evaluate such programs. Topics vary, but include an emphasis on public health and safety issues. Individual and group behavior change, and cultural design, are each considered when targeting problems.

PSYC 460/560. Psychology of African Americans. Lecture 3 hours; 3 credits. Prerequisite: PSYC 201S or permission of the instructor. This course examines the issues and perspectives related to the psychological evolution of African Americans in the United States. Particular emphasis is placed on exploring the

discipline of psychology from an Afrocentric focus.

PSYC 461/561. Drug Abuse and Dependence. Lecture 3 hours; 3 credits. Prerequisite: PSYC 201S. This course offers an intensive review and clinical analysis of the issues and problems associated with addictive behavior with an emphasis on alcohol abuse and dependency.

PSYC 487, 488. Honors Program in Psychology. For ODU psychology majors only; 3 credits each semester. Prerequisites: PSYC 497; cumulative GPA of 3.25 or higher and psychology GPA of 3.50 or higher; permission of the departmental Honors Program chair. With psychology faculty supervision, student develops an honors thesis proposal (in PSYC 487) for approval by the Psychology Honors Program committee. Student conducts the supervised honors research and documents it in a thesis (in PSYC 488) for approval by the Psychology Honors Program committee. Student also participates in a required seminar to discuss and present the research. See section on Honors Program in Psychology in this Catalog.

PSYC 489, 490. Readings in Psychology. 3 hours; 3 credits. Prerequisite: approval by supervisory faculty member and department. The course may be taken only once. An individualized course in which the student does library research and writes a paper.

PSYC 495/595. Topics in Psychology. 1-3 credits each semester. Prerequisite: PSYC 201S or permission of the instructor. The department offers selected topics that may not be offered regularly. These special topics will appear in the Schedule of Classes each semester.

PSYC 651. Developmental Psychology. Lecture and discussion 3 hours; 3 credits. Prerequisite: PSYC 203S. This course covers topics related to the physical, cognitive, social and emotional aspects of growth, from conception to death. It focuses on human growth and development, but other organisms are also considered.

PSYC 653. Personality Psychology: Theory and Research. Lecture and discussion 3 hours; 3 credits. Prerequisite: PSYC 408. The course deals with basic issues and contemporary topics in personality research. The basic issues covered include personality measurement, heredity, biological approaches, personality development, and motives. Current topics in personality research that are covered include the unconscious, personal efficacy, sex and gender, control, self-concept, stress and illness, sexuality, and disorders of personality.

PSYC 661. Psychopathology. Lecture and discussion 3 hours; 3 credits. Prerequisite: PSYC 405. The course provides a conceptual basis for the study of abnormal behavior. Students conduct an in-depth review of the literature related to neuroses, personality disorders, and psychophysiological disorders.

PSYC 662. Human-Computer Interface Design. Lecture 3 hours; 3 credits. Prerequisite: graduate standing and permission of the instructor. Course introduces students to the fundamental principles of human-computer interaction. Exposes students to basic psychological concepts and shows how they are used to create effective interface designs. Covers both theoretical and practical aspects of interface design.

PSYC 663. Intellectual Assessment. Lecture and discussion 3 hours; 3 credits. Prerequisite: PSYC 412 or equivalent or permission of the

instructor. Primary focus is on intellectual assessment for children and adults. Basic instruction in administration and interpretation of standard tests of intelligence will be provided. Additional topics include tests of achievement and memory function.

PSYC 664. Personality Assessment. Lecture and discussion 3 hours; 3 credits. Prerequisite: PSYC 412 or equivalent or permission of the instructor. Course covers major methods of personality assessment including objective and projective instruments. Emphasis is on current theory and applications of personality assessment.

PSYC 667. Practicum in Psychology. 2-5 credits. Prerequisites: 15 graduate course hours (including PSYC 663) and permission of the instructor. Students will receive supervised training in an applied setting in the area of clinical or industrial psychology.

PSYC 672. Advanced Physiological Psychology. Lecture and discussion 3 hours; 3 credits. This course examines the complex physiological structures and processes related to the organism's interaction with its environment; neuronal physiology, sensory and motor systems, as well as motivational, emotional, and learning mechanisms.

PSYC 696. Topics in Psychology. 3 credits.

PSYC 697. Selected Topics in Psychology. 1-3 credits. Prerequisites: permission of the instructor and graduate program director. This course provides opportunities for advanced investigations of selected topics in psychology. May be taken by students beyond the first year of graduate study who wish to pursue topics not covered by regularly scheduled courses.

PSYC 698. Research in Psychology. 3 credits. Individual project under guidance of a research advisor. Required for students choosing thesis option. Limited to a total of 3 hours of credit.

PSYC 699. Thesis. 1-3 credits. Prerequisite: PSYC 698. Individual project under guidance of a research advisor. Required for students choosing thesis option.

PSYC 712/812. History and Systems of Psychology. Lecture and discussion 3 hours; 3 credits. A survey of the historical roots of modern psychology.

PSYC 713/813. Research Project I. Lecture 1 hour; 1 credit. Students design a research project, completing the background literature review and methods sections for the project. A formal, oral presentation of the research project is required.

PSYC 714/814. Research Project II. Lecture 2 hours; 2 credits. Students collect data, conduct data analyses and complete the results and discussion sections of a research report. A formal, oral presentation of the research project and its results is required.

PSYC 727/827. Analysis of Variance and Experimental Design. 4 credits; 3 Lecture hours; 2 Lab hours. Prerequisite: admission into the psychology M.S. or Ph.D. program or permission of the instructor. Review of the basic descriptive and inferential statistical procedures with a heavy emphasis on fundamental and advanced analysis of variance techniques. Topics include contrasts, factorial designs, within-subject and mixed designs, and analysis of covariance. Course materials are covered in the context of classical experimental and quasi-experimental design.

PSYC 728/828. Regression and Correlational Design. Lecture 3 hours; Lab 2 hours; 4 credits. Prerequisite: admission into the psychology M.S. or Ph.D. program or permission

of the instructor and PSYC 727/827 or equivalent. Course covers correlation with heavy emphasis on regression analysis in the context of the general linear model. Topics include partial correlations, categorical and continuous interactions, non-linear regression, and multivariate statistics. Course materials are covered in the context of correlational designs and survey research.

PSYC 730/830. Teaching Statistics and Research Practicum. 1 or 3 credits. Prerequisites: PSYC 727 or 824 or 827 and PSYC 728 or 825 or 828. Advanced graduate students in Psychology will have the opportunity to direct statistics and research methods labs for graduate statistics courses. Students' main role will be acting as peer mentors for the new graduate students. Other possible responsibilities may include grading, creating lab activities and assignments, and supervising students' research projects. Students will be evaluated on their teaching effectiveness and performance.

PSYC 731/831. Human Cognition. Lecture and discussion 3 hours; 3 credits. Prerequisite: admission into the psychology M.S. or Ph.D. program or permission of the instructor. An investigation of the ways in which people process and retain information, make decisions, and solve problems. Current models of structures and processes of human memory and cognition are discussed with particular emphasis on neurocognitive evidence of the brain mechanisms involved in cognition.

PSYC 734/834. Proseminar in Applied Experimental Psychology. Lecture and discussion 3 hours; 3 credits. Prerequisite: admission into the graduate program in psychology or permission of the instructor. This course introduces students to the breadth of problem areas to which applied experimental (AE) psychology is applicable. Research methods and ethics employed by AE psychologists are discussed. Examples of AE research are reviewed, and students have opportunities to apply techniques to actual or simulated problems.

PSYC 735/835. Health Psychology. Lecture 3 hours; 3 credits. This course focuses on contemporary theory and research topics in health psychology. The course examines psychological and behavioral issues affecting health maintenance, coping with life-threatening illnesses and chronic diseases, and health promotion. The course uses the biopsychosocial (mind-body) model as an organizing framework, emphasizing the dynamic interactions among biological, social, personality, and behavioral factors jointly in influencing people's health. The course is conducted as a seminar.

PSYC 736/836. Multilevel Models: HLM. Lecture 3 hours; 3 credits. Prerequisite PSYC 728/828 or equivalent. Social science data frequently have a hierarchical or multilevel structure as a consequence of sampling designs or repeated measures. The purpose of the course is to introduce students to the basic principles and applications of hierarchical linear modeling in social science research. Topics covered include an introduction to multilevel analyses, random intercept models, random slope models, hypotheses testing, hierarchical models for limited dependent variables, model fitting, three-level models, and repeated-measures applications.

PSYC 741/841. Sensation and Perception. Lecture and discussion 3 hours; 3 credits. A survey of human sensation and perception emphasizing historical contributions, recent

theoretical and methodological developments, and empirical findings.

PSYC 744/844. Program Evaluation. Lecture 3 hours; 3 credits. Prerequisite: 727/827 and 728/828 (or current enrollment). This course is designed to introduce students to the field of program evaluation as well as to give students practical experience conducting a program evaluation. Students will get experience creating and conducting qualitative and quantitative assessments. A course goal is to work in small groups to conduct a program evaluation.

PSYC 745/845. Psychometric Theory. Lecture and discussion 3 hours; 3 credits. Prerequisite: PSYC 728/828 or equivalent. This course surveys classical and modern test theory, correlational methods, meta-analysis, reliability and validity theory, test development, and change measurement.

PSYC 746/846. Structural Equation Modeling. Lecture 3 hours; 3 credits. Prerequisite: PSYC 745/845 or equivalent. This course covers the topics of linear structural equation modeling and focuses on estimation, measurement models, confirmatory and hierarchical factor analysis, structural equations, longitudinal models, multisample analyses, and mean structures.

PSYC 747-847. Multivariate Methods for the Social/Behavioral Sciences. Lecture 3 hours; 3 credits. Prerequisite: PSYC 728/828 or equivalent. The course is focused on methods and techniques for analyzing multivariate data. Emphasis includes both conceptual and computational aspects of the most commonly used analytical tools when experimental units have multiple measures. A goal of the course is to avoid the extremes of "plug n chug" analyses on the one hand and theorems and proofs on the other to provide generalizable working knowledge of multivariate statistics. Featured techniques are MANOVA, MANCOVA, profile analysis, discriminant analysis, canonical correlation, principal components analysis, and exploratory factor analysis.

PSYC 749/849. Advanced Social Psychology. Lecture and discussion 3 hours; 3 credits. This course discusses the behavior of the human as a member of a group. Topics include attitude theory and change, interpersonal attraction, group dynamics, and related theory and applied research techniques.

PSYC 750/850. Organizational Psychology. Lecture and discussion 3 hours; 3 credits. Prerequisite: PSYC 317 or equivalent. This course provides an overview of organizational behavior and theory. Topics include leadership, motivation, teams, social processes at work, workplace relationships, organization structure and environments, and organizational development and change.

PSYC 763/863. Personnel Psychology. Lecture and discussion 3 hours; 3 credits. Prerequisite: PSYC 727/827 or equivalent. This course provides an overview of personnel psychology. Topics include reliability and validity, job analysis, performance criteria, performance appraisal, employee recruitment, employee selection, and training and development.

PSYC 770/870. Human Factors Psychology. Lecture 3 hours; 3 credits. Prerequisites: PSYC 731/831 and 741/841 or equivalents or permission of the instructor. The application and evaluation of psychological principles and research relating human behavior to the design of tools, technology, and the work environment. Theory, methods, and application are emphasized.

PSYC 771/871. Ergonomics. Lecture 3 hours; 3 credits. Basic overview and application of anthropometry, biomechanics, functional anatomy, mechanics, and human physiology for the design of industrial tools, equipment, and workstations.

PSYC 795/895. Topics in Psychology I. 1-4 credits.

PSYC 796/896. Topics in Psychology II. 1-4 credits.

PSYC 810. Seminar in Professional Aspects of Industrial/Organizational Psychology. Lecture 3 hours; 3 credits. Prerequisite: admission into the I/O Ph.D. program. Topics covered include standards of professional behavior of I/O psychologists, the governance of psychology, I/O psychology professional associations, and professional opportunities for I/O psychologists.

PSYC 815. Teaching Psychology. Lecture and discussion 1 hour; 1 credit. The teaching of psychology.

PSYC 824. ODU Research Methods I: Analysis of Variance and Experimental Design. Lecture 3 hours; Lab 2 hours; 4 credits. Prerequisite: admission into Virginia Consortium PSYD program or permission of the instructor. Review of basic descriptive and inferential statistical procedures with a heavy emphasis on fundamental and advanced analysis of variance techniques. Topics include contrasts, factorial designs, within-subject and mixed designs, and analysis of covariance. Course materials are covered in the context of classical experimental and quasi-experimental design.

PSYC 825. ODU Research Methods II: Regression and Correlational Design. Lecture 3 hours; Lab 2 hours; 4 credits. Prerequisite: admission into Virginia Consortium PSYD program or permission of the instructor. Course covers correlation with heavy emphasis on regression analysis in the context of the general linear model. Topics include partial correlations, categorical and continuous interactions, non-linear regression, and multivariate statistics. Course materials are covered in the context of correlational designs and survey research.

PSYC 833. Grant and Manuscript Writing. Lecture 3 hours; 3 credits. Prerequisite: admission to the doctoral program in psychology and completion of master's thesis, or permission of instructor. The course is designed: (1) to teach students to write article-length scholarly manuscripts in APA format of publishable quality, and (2) to teach students the critical components of grant applications. By the end of this course, each student will have prepared a manuscript that is ready for submission to a peer-reviewed journal and have completed sections of a federal grant application.

PSYC 851. Micro Organizational Psychology. Lecture and discussion 3 hours; 3 credits. Prerequisite: PSYC 750/850 or permission of the instructor. The study of individual and group behavior in organizations. Emphasis is placed on classic and contemporary leadership and motivation theory and research.

PSYC 853. Macro Organizational Psychology. Lecture and discussion 3 hours; 3 credits. This class uses a multilevel perspective to provide a foundation in organization theory. Students develop a theory of organizing that incorporates variables at the individual, dyad group, unit organization, and organization network levels of analysis.

PSYC 854. Organizational Development and Change. Lecture and discussion 3 hours; 3 credits. Prerequisites: PSYC 851 and 853 or permission of

the instructor. This seminar discusses models and theories of organizational change and interventions that are commonly used to foster organizational development and effectiveness. Students participate in an organizational consulting project to apply lessons learned in the classroom.

PSYC 855. Field Research Methods in Organizational Psychology. Lecture, discussion, and field research project; 3 credits. Prerequisite: admission into the I/O Ph.D. program or permission of the instructor. This seminar discusses the design and analysis of surveys, quasi-experiments, questionnaires, interviews and other methods for studying organizational processes. Both quantitative and qualitative research methods are discussed.

PSYC 858. ODU Clinical and Ethical Issues. Lecture 1 hour; 1 credit. Weekly seminars address professional and ethical issues in the practice of clinical psychology.

PSYC 859. ODU-Cognitive and Behavioral Therapies. Lecture 3 hours; 3 credits. Covers theory and techniques of cognitive and behavioral approaches. Applications for the assessment and treatment of adults, children, couples, and families are discussed. Students gain practical experience in these techniques as well as case conceptualization skills.

PSYC 860. ODU Practicum in Clinical Psychology. 3 hours.

PSYC 861. ODU Advanced Practicum in Clinical Psychology. 3-6 hours.

PSYC 864. Human Resource Development. Lecture and discussion 3 hours; 3 credits. Prerequisite: PSYC 763/863 or permission of the instructor. This course covers research findings, methodologies, and evaluation designs for the training and development of personnel in organizations. Specific topics include needs assessment, learning principles and system design.

PSYC 865. Advanced Personnel Psychology I. Lecture and discussion 3 hours; 3 credits. Prerequisite: PSYC 763/863 or permission of the instructor. This course covers the topics of job analysis, psychological assessment, criterion development, selection interviewing, performance appraisal, validation, legal issues, and human resource planning.

PSYC 866. Advanced Personnel Psychology II. Lecture and discussion 3 hours; 3 credits. Prerequisite: PSYC 763/863 or permission of the instructor. This course in advanced personnel psychology covers the topics of recruitment, classification, utility analysis, training, compensation, organization, assessment and development, career development and consulting strategies.

PSYC 867. Human Performance Assessment. Lecture and discussion 3 hours; 3 credits. Prerequisites: PSYC 770/870 or permission of the instructor. This course covers the job analysis and performance appraisal/management (PA/MA). Specific topics include job analysis methods; use of job analysis results for various HR functions; performance assessment/appraisal methods; multi-source feedback; employee reactions to and use of PA/MA information; rater cognitive processes and affect; rater goals, bias, and accuracy; and organizational practical and legal issues surrounding job analysis and PA/PM.

PSYC 872. Methods, Measures, Techniques, and Tools in Human Factors. Lecture 3 hours; 3 credits. Experiential survey of methods, measures, techniques, and prototyping tools available for human factors investigations in laboratory and

field settings. The design and execution of experimental investigations utilizing the measures and tools are emphasized.

PSYC 873. ODU Biological Bases I: Physiological Psychology. Lecture 3 hours; 3 credits. Examines the physiological mechanisms for motivation, learning, memory and behavior disorders. Also included are such topics as the neurophysiological bases of drug action, psychophysiology, language disorders, developmental neurobiology.

PSYC 874. ODU Biological Bases III: Drugs and Behavior. Lecture 3 hours; 3 credits. This course deals with substance abuse disorders, identification/diagnosis, etiology, treatment and recovery. It also covers the proper use of and desired effects and side effects of medications used in the treatment of psychiatric disorders.

PSYC 875. Advanced Visual Perception and Visual Displays. Lecture 3 hours; 3 credits. Detailed review of the physiological bases of visual perception, the capabilities and limitations of the visual systems, and the metrics involved in vision research. A survey of current advanced visual displays is presented, stressing the interaction of the characteristics of these displays with the capabilities and limitations of the human visual system.

PSYC 876. Human-Computer Interaction. Lecture 3 hours; 3 credits. Review of the physical, cognitive, and performance capabilities and limitations of humans as they interact with modern computer systems. Emphasis is placed on the tools, techniques and procedures for the assessment and effective design of computer hardware, software and displays of information.

PSYC 877. Theories, Models and Simulations in Human Factors. Lecture 3 hours; 3 credits. Survey of the historical and philosophical bases for the use of theories, models, and simulations in human factors applications with a critical evaluation of existing theories, mathematical and cognitive models, and simulations in terms of actual and potential contributions to the field.

PSYC 878. Advanced Cognition and Information Processing. Lecture 3 hours; 3 credits. Historical survey of human information processing literature, detailed review of recent developments in cognitive psychology, and examination of the purposes, role and scope of cognitive engineering.

PSYC 891. Industrial/Organizational Internship. 1 credit.

PSYC 897. Individual Study (Readings). 1-4 credits.

PSYC 898. Research. 3 credits.

PSYC 899. Dissertation. 1-9 credits per semester with limitation of a total of 24 credits.

The following courses are Clinical Psychology Doctorate courses and require enrollment in that program or permission of the clinical director.

PSYC 824. ODU Advanced Statistics. 3 credits.

PSYC 825. ODU Research Design. 3 credits.

PSYC 832. ODU-Learning. 3 credits.

PSYC 856. ODU Consultation/Supervision. 3 credits.

PSYC 857. ODU Assessment: Projective Testing. 3 credits.

PSYC 859. ODU Psychotherapy: Behavior Therapy and Assessment. Lecture 3 hours; 3 credits. Covers theory and techniques of cognitive and behavioral approaches. Applications for the assessment and treatment of adults, children,

couples, and families are discussed. Students gain practical experience in these techniques as well as case conceptualizational skills.

PSYC 860. ODU Practicum in Clinical Psychology. 3 credits.

PSYC 861. ODU Advanced Practicum in Clinical Psychology. 3-6 credits.

PSYC 862. ODU Psychodynamic Therapy. 3 credits.

PSYC 873. ODU Biological Bases of Behavior. 3 credits.

PSYC 890. ODU Internship in Clinical/Community Psychology. 4 credits each semester for 3 semesters. Prerequisite: Permission of the clinical director. Must be enrolled in psychology doctorate program.

PSYC 894. ODU Clinical Dissertation. 1-6 credits each semester for variable credit.

PSYC 999. Psychology 999. 1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

Sciences — SCI

SCI 693. Writing for the Sciences. Lecture 1 hour; 1 credit. Issues specific to writing in science disciplines. Topics include: English usage, writing a paper, revising a draft, the publication process, preparing a talk, writer's tools, computer aids

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Lloyd Wolfenbarger Jr., *Professor Emeritus of Biological Sciences*
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Robert J. Wunderlin, *Associate Professor Emeritus of Psychology*
Betty J. H. Yarborough, *Eminent Scholar Emerita and Constance and Colgate Darden Professor Emerita of Education*
James H. Yuan, *Professor Emeritus of Chemistry and Biochemistry*
Helen Yura-Petro, *Professor Emerita of Nursing*
Michelle L. Zimmerman, *Associate Professor Emerita of Nursing*

Faculty*

Hussein M. Abdel-Wahab (1994; 1980). Professor of Computer Science. B.S., Cairo University (Egypt); A.M., Ph.D., University of Waterloo.

Eileen P. Abrahamsen (1985; 1979). Associate Professor of Communication Disorders and Special Education. A.B., Elmira College; M.S., State University of New York; Ed.D., Columbia University.

John A. Adam (1984; 1984) Professor of Mathematics and Statistics. B.Sc., Ph.D., University of London. Designated as a University Professor.

Francis Adams (2001; 1995). Associate Professor of Political Science and Geography. B.A., Saint Thomas College, M.A., Syracuse University; Ph.D., Cornell University.

Jennifer L. Adamski (2005; 1996). Senior Lecturer of Chemistry and Biochemistry. B.S., Villanova University; M.S., University of Virginia.

Amy B. Adcock (2004; 2004). Assistant Professor of STEM Education and Professional Studies. B.S., Memphis State University, M.S., Ed.D., The University of Memphis.

Vinod B. Agarwal (1992; 1981). Professor of Economics. A.B., Delhi University (India); A.M., University of Delhi; Ph.D., University of California at Santa Barbara.

A. Osman Akan (1989; 1982). Associate Dean of the Frank Batten College of Engineering and Technology and Professor of Civil and Environmental Engineering. B.S.C.E., Middle East Technical University (Turkey); M.S.C.E., Ph.D., University of Illinois; P.E.

Shabbir Akhtar (2008; 2002). Associate Professor of Philosophy and Religious Studies. B.A., M.A., St Catharine's College, Cambridge (United Kingdom); M.A., Ph.D., University of Calgary (Canada).

Thomas E. Alberts (1999; 1986). Professor of Aerospace Engineering. B.S., M.S., University of Wisconsin-Milwaukee; Ph.D., Georgia Institute of Technology.

Sacharia Albin (1996; 1986). Associate Professor of Electrical and Computer Engineering. B.Sc., M.Sc., University of Kerala (India); Ph.D., University of Poona (India).

Tami C. Al-Hazza (2004; 2003). Assistant Professor of Teaching and Learning. B.S., Old Dominion University; M.Ed., Trenton State College; Ph.D., Old Dominion University.

Mohamad G. Alkadry (2008; 2008). Associate Professor of Urban Studies and Public Administration. B.A., Carleton University (Canada); M.P.A., Concordia University (Canada); Ph.D., Florida Atlantic University.

Jenifer Alonzo (2008; 2007). Assistant Professor of Communication and Theatre Arts. B.A., University of Colorado; M.F.A., Towson State University.

Kelly N. Alvey (2006; 2006). Instructor of Information Technology/Decision Sciences. B.S., Oregon State University; M.S., Indiana University.

Moskov Amarian (2004; 2004). Associate Professor of Physics. M.S., Armenian Pedagogical Institute; Ph.D., Yerevan Physics Institute (Armenia).

Nana Amoah (2008; 2008). Assistant Professor of Accounting. B.Sc., University of Science and Technology (Ghana); M.B.A., Howard University; Ph.D., Morgan State University.

Bridget L. Anderson (2009; 2005). Associate Professor of English. B.A., Western Carolina University; M.A., North Carolina State University; Ph.D., University of Michigan.

Eric E. Anderson (1990; 1984). Associate Professor of Economics. B.A., University of Wisconsin; M.A., Ph.D., University of Washington.

Peter G. Anderson, (2007; 2007). Visiting Assistant Professor of Political Science and Geography. B.A., M.A., State University of New York at Albany; Ph.D., University of Utah.

Sarah A. Appleton (2007; 2007). Visiting Assistant Professor of English. B.A., Rhode Island College; M.A., University of Rhode Island; Ph.D., University of Connecticut.

Alireza Ardalan (1995; 1983). Associate Dean, College of Business and Public Administration and Professor of Information Technology/Decision Sciences. B.Sc., University of Shiraz (Iran); M.B.A., Ph.D., University of Arizona.

Roya K. Ardalan (2008; 1999). Senior Lecturer of Information Technology/Decision Sciences. B.Sc., M.B.A., University of Arizona; Ph.D., Old Dominion University.

Aaron D. Arndt (2008; 2008). Assistant Professor of Marketing. B.S., University of Oregon; M.B.A., Washington State University; Ph.D., University of Oklahoma.

Robert Arnett (2005; 2005). Associate Professor of Communication and Theatre Arts. B.F.A., Pacific Lutheran University; M.A., Washington State University; Ph.D., University of Southern Mississippi.

Vijayan K. Asari (2007; 2000). Professor of Electrical and Computer Engineering. B.S. University of Kerala (India); M.Tech., Ph.D., Indian Institute of Technology.

Ivan K. Ash (2005; 2005). Assistant Professor of Psychology. B.S., Central Michigan University; M.A., Ph.D., University of Illinois at Chicago.

Robert L. Ash (1976; 1967). Professor of Aerospace Engineering. B.S., Kansas State University; M.S., Ph.D., Tulane University; P.E. Designated as an Eminent Scholar.

Larry P. Atkinson (1985; 1985). Professor of Ocean, Earth, and Atmospheric Sciences and Slover Professor of Oceanography. B.S., M.S., University of Washington; Ph.D., Dalhousie University (Canada). Designated as an Eminent Scholar.

Erland James Baesler (1996; 1990). Associate Professor of Communication and Theatre Arts. B.A., M.A., San Jose State University; Ph.D., University of Arizona.

Nancy A. Bagranoff (2003; 2003). Dean of the College of Business and Public Administration and Professor of Accounting. A.A., Briarcliff College; B.S., The Ohio State University; M.S., Syracuse University; Ph.D., The George Washington University.

Cheryl S. Baker (2003; 1993). Senior Lecturer of Communication Disorders and Special Education. B.S., M.S., Ph.D., Old Dominion University.

E. Andrew Balas (2004; 2004). Dean of the College of Health Sciences and Professor of Community and Environmental Health. M.D., School of Medicine, Semmelweis University (Hungary); M.S., Eotvos University (Hungary); Ph.D., University of Utah.

Ian Balitsky (2005; 1996). Professor of Physics. M.S., St. Petersburg State University (Russia); Ph.D., St. Petersburg Nuclear Physics Institute (Russia).

Catherine M. Banks (2007; 2005). Research Assistant Professor, Virginia Modeling, Analysis and Simulation Center. B.A., B.A., Christopher Newport University; M.A., Ph.D., Old Dominion University.

Han P. Bao (1992; 1992). Professor of Mechanical Engineering and Mitsubishi Ksaei Professor of Engineering Manufacturing. B.S., M.S., Ph.D., University of New South Wales (Australia).

Phyllis D. Barham (1997; 1983). Senior Lecturer of Nursing. B.S.N., M.S., Old Dominion University.

Barbara Bartkus (2003; 1997). Associate Professor of Management. B.S., M.B.A., Hawaii Pacific University; Ph.D., Texas A&M University. Designated as a University Professor.

Ian K. Bartol (2009; 2003). Associate Professor of Biological Sciences. B.S., University of Michigan; M.S., Ph.D., The College of William and Mary/Virginia Institute of Marine Science.

David R. Basco (1986; 1986). Professor of Civil and Environmental Engineering. B.S.C.E., M.S.C.E., University of Wisconsin; Ph.D., Lehigh University; P.E.

Deborah B. Bauman (1988; 1982). Associate Professor of Dental Hygiene. B.S.D.H., M.S., Old Dominion University.

Helmut Baumgart (2005; 2005). Professor of Electrical and Computer Engineering and Virginia Micro-Electronics Consortium Endowed Professorship in Microelectronics. B.S., University of Heidelberg (Germany); M.S., Purdue University; Ph.D., University of Stuttgart and Max Planck Institute of Solid State Research (Germany).

Sebastian Bawab (2009; 1992). Professor of Mechanical Engineering. B.S., M.S., State University of New York - Buffalo; Ph.D., The Ohio State University.

Frederick S. Bayersdorfer (1997; 1997). Instructor of Art and Assistant Dean for Arts, College of Arts and Letters. B.F.A., M.A., Old Dominion University.

Oktaý Baysal (1992; 1982). Dean of the Frank Batten College of Engineering and Technology and Professor of Aerospace Engineering. B.S., Technical University of Istanbul; M.S., University of Birmingham (U.K.); Ph.D., Louisiana State University; P.E. Designated as an Eminent Scholar.

Craig A. Bayse (2007; 2001). Associate Professor of Chemistry and Biochemistry. B.S., Roanoke College; Ph.D., Texas A&M University.

Stephen J. Beebe (2007; 2007). Research Professor, Frank Reidy Research Center for Bioelectrics. B.S., Ohio University; Ph.D., Medical College of Ohio.

Joshua G. Behr (2007; 2001). Associate Professor of Political Science and Geography. A.B., M.A., California State University - Fullerton; Ph.D., University of New Orleans.

Lee A. Belfore II (2003; 1997). Associate Professor of Electrical and Computer Engineering. B.S., Virginia Polytechnic Institute and State University; M.S.E., Princeton University; Ph.D., University of Virginia.

* The listing reflects the faculty as of May 2009. The dates in parentheses indicate the following: the first date, the year in which the present rank was attained; the second date, the year when the individual was first appointed to the faculty; a third date, the year of reappointment.

- Angela R. Bell** (2004; 2004). Assistant Professor of Medical Laboratory and Radiation Sciences. A.A., Hartnell College; B.S., Christopher Newport University; M.S., Troy State University.
- Richard S. Benjamin** (1995; 1989). Associate Professor of Nursing. B.S.N., Armstrong State College; M.S.N., Medical College of Georgia; M.P.H., University of Pittsburgh; Ph.D., University of Texas.
- Linda K. Bennington** (2007; 2001). Senior Lecturer of Nursing. B.S., M.S., West Virginia University; B.S.N., M.S.N., Old Dominion University.
- Gary N. Bernstein** (2008; 2008). Lecturer of Human Movement Sciences. B.S., Slippery Rock State College; M.S., North Texas State University.
- Walter W. Berry** (1986; 1977-78; 1980). Senior Lecturer of Accounting. B.S.B.A., M.B.A., Old Dominion University; C.P.A.
- Ali Beskok** (2006; 2006). Professor of Aerospace Engineering and Batten Endowed Professor of Computational Engineering. B.S.M.E., Middle East Technical University (Turkey); M.S.M.E., Indiana University-Purdue University - Indianapolis; M.S.E., Ph.D., Princeton University.
- Gnana K. Bharathy** (2008; 2008). Assistant Professor of Engineering Management and Systems Engineering. B.T., National Institute of Technology (India); M. E., University of Canterbury (New Zealand); M.S., Ph.D., University of Pennsylvania.
- Janet M. Bing** (1996; 1982). Professor of English. A.B., Coe College; A.M., Stanford University; Ph.D., University of Massachusetts. Designated as a University Professor.
- Jens F. Bischof** (2001; 2001). Lecturer of Ocean, Earth, and Atmospheric Sciences. B.S., M.S., Ph.D., Christian Albrechts University (Germany).
- James P. Bliss** (2001; 2001). Associate Professor of Psychology. B.S., M.S., Ph.D., University of Central Florida.
- Shirley C. Blow-Brockman** (1983; 1983). Lecturer in the Writing Center. B.A., M.A., Norfolk State University.
- Robyn Bluhm** (2008; 2008). Assistant Professor of Philosophy and Religious Studies. B.A., B.Sc., Laurentian University (Canada); M.A., McMaster University (Canada); Ph.D., The University of Western Ontario (Canada).
- Michael Blumenthal** (2008; 2006). Visiting Professor of English and Mina Hohenberg Darden Endowed Chair in Creative Writing. B.A., State University of New York at Binghamton; J.D., Cornell Law School.
- Jonna Linkous Bobzien** (2008; 2008). Lecturer of Communication Disorders and Special Education. B.S., M.S.Ed., Old Dominion University.
- Alexander B. Bochdansky** (2004; 2004). Assistant Professor of Ocean, Earth and Atmospheric Sciences. M.S., University of Vienna (Austria); Ph.D., Memorial University of Newfoundland (Canada).
- Przemyslaw Bogacki** (1996; 1990). Associate Professor of Mathematics and Statistics. M.S., Adam Mickiewicz University in Poznan (Poland); Ph.D., Southern Methodist University.
- Linda Bol** (2008; 2000). Professor of Educational Foundations and Leadership. B.A., M.A., California State University at Fresno; Ph.D., University of California at Berkeley.
- Stella B. Bondi** (2008; 2007). Assistant Professor of Engineering Technology. B.S., M.E.M, Ph.D., Old Dominion University.
- Timothy B. Bostic** (2007; 2006). Lecturer of English. B.B.A., George Washington University; B.A., M.A., Old Dominion University; Ph.D., Virginia Commonwealth University.
- Martha G. Bountress** (1982; 1976). Instructor and Clinical Speech Pathologist in Communication Disorders and Special Education. B.S., M.S., North Texas State University.
- Nicholas G. Bountress** (1986; 1975). Professor of Communication Disorders and Special Education. B.S., Central Connecticut State College; M.S., Southern Connecticut State College; Ed.D., North Texas State University.
- Leon F. Bouvier** (2008; 1988; 2008). Visiting Professor of Sociology and Criminal Justice. B.S., Spring Hill College; M.A., Ph.D., Brown University.
- Shannon R. Bowling** (2004; 2004). Assistant Professor of Engineering Management/Systems Engineering. B.S., Bluefield State College; M.S., East Tennessee State University; Ph.D., Clemson University.
- Yang Li Bowling** (2008; 2008). Lecturer of Foreign Languages and Literatures. B.A., Nanchang University (China); M.A., University of Nationalities (China).
- Christopher M. Boyle** (2008; 2008). Instructor of Computer Science. B.S., Old Dominion University; M.S., Virginia Polytechnic Institute and State University.
- Carole B. Brady** (1989; 1989). Instructor, Child Study Center. B.S., M.S.Ed., Old Dominion University.
- John D. Branch III** (2001; 1995). Associate Dean of the Darden College of Education and Associate Professor of Human Movement Sciences. B.A., Furman University; M.S., Ph.D., University of South Carolina.
- Charlene D. Brassington** (2008; 2007; 2008). Lecturer of Community and Environmental Health. B.S., The Pennsylvania State University; M.S., Old Dominion University.
- Sandra Breeden** (1996; 1996). Lecturer, College of Health Sciences. B.S., M.Ed., Indiana University; M.A. Webster University.
- William Henry Brenner** (2001; 1970). Professor of Philosophy and Religious Studies. A.B., College of St. Thomas (Minnesota); A.M., Ph.D., University of Virginia.
- Miriam Bridges** (2008; 2008). Business Reference Librarian and Librarian I. B.A., Elizabeth City State University; M.L.H.R., The Ohio State University; M.L.S., University of Maryland – College Park.
- Melissa Bristow** (2008; 2008). Lecturer of Philosophy and Religious Studies. B.A., M.A., Old Dominion University.
- Colin Paul Britcher** (2002; 1985). Professor of Aerospace Engineering. B.S., M.S., Ph.D., Southampton University (England).
- Kenneth G. Brown** (1989; 1982). Professor of Chemistry and Biochemistry. A.B., Syracuse University; Ph.D., Brown University.
- Nina W. Brown** (1994; 1968). Professor of Counseling and Human Services. B.S., Virginia State College; M.S. in Ed., Old Dominion College; Ed.D., College of William and Mary. Designated as an Eminent Scholar.
- Robert L. Brown** (1998; 1998). Instructor, The Governor's School for the Arts.
- Janet Brunelle** (2006; 1998). Senior Lecturer of Computer Science. B.S., M.S., Old Dominion University.
- Lindal Buchanan** (2008; 2008). Assistant Professor of English. B.A., The University of Mississippi; M.A., The University of New Orleans; Ph.D., The University of Louisiana at Lafayette.
- Stephen L. Büeltman** (2007; 2003). Assistant Professor of Physics. University Physics Diploma, Ph.D., Bielefeld University (Germany).
- Glenn A. Bunton** (2006; 1998). Systems Librarian for Internet Technologies and Librarian III. B.A., Miami University; M.S.L.S., M.S., University of North Texas.
- David J. Burdige** (1999; 1985). Professor of Ocean, Earth, and Atmospheric Sciences. B.A., Swarthmore College; Ph.D., Scripps Institute of Oceanography, University of California at San Diego. Designated as an Eminent Scholar.
- Dana D. Burnett** (2006; 1972). Professor of Educational Foundations and Leadership. B.S., Allegheny College; M.S., Ph.D., Indiana University.
- Carrie P. Burris** (2006; 2006). Lecturer of Communication Disorders and Special Education. B.S., West Virginia University; M.S., East Carolina University.
- Mark J. Butler** (2000; 1988). Professor of Biological Sciences. B.A., Wittenburg University; M.S., Ohio State University; Ph.D., Florida State University.
- Carroll M. Butler, Jr.** (2006; 1997; 2006). Senior Lecturer of Communication Disorders and Special Education. B.S., M.S.Ed., Old Dominion University.
- Lan Cao** (2005; 2005). Assistant Professor of Information Technology/Decision Sciences. B.E, Donghua University (China); M.S., Georgia Institute of Technology; M.S., Ph.D., Georgia State University.
- Ann Campbell** (2001; 1996). Senior Lecturer of Nursing. B.A., Old Dominion University; B.S.N., Norfolk State University.
- Christina Campbell-Westmont** (2008; 2008). Instructor of History. A.A., Frederick Community College; B.A., Westminster College; M.A., Old Dominion University.
- Michael C. Carhart** (2009; 2004). Associate Professor of History. B.A., Bethel College; M.A., The Pennsylvania State University; Ph.D., Rutgers, The State University of New Jersey.
- Diane Cyr Carmody** (2001; 1996). Associate Professor of Sociology and Criminal Justice. B.A., M.A., Ph.D., University of New Hampshire. Designated as a University Professor.
- Ellen M. Carpenter** (2006; 2006). Lecturer of Psychology. B.A., Oberlin College; M.A., University of North Carolina – Chapel Hill; Ph.D. Old Dominion University.
- Kent E. Carpenter** (2005; 1996). Professor of Biological Sciences. B.S., Florida Institute of Technology; Ph.D., University of Hawaii.
- Jimmie Carraway** (1992; 1985; 1992). Senior Lecturer of Information Technology/Decision Sciences. B.S., M.B.A., Old Dominion University.
- Robert W. Case** (2002; 1996). Associate Professor of Human Movement Sciences. B.S., Brockport State College; M.A., Michigan State University; Ph.D., Ohio State University.
- Mecit Cetin** (2008; 2008). Assistant Professor of Civil and Environmental Engineering. B.S., Bogazici University (Turkey); M.S., Ph.D., Rensselaer University.
- George Chackman** (2008; 2003; 2008). Instructor of Mathematics and Statistics. B.S., M.S., Old Dominion University.

- N. Rao Chaganty** (1998; 1982). Professor of Mathematics and Statistics. B. Stat., M. Stat., Indian Statistical Institute; M.S., Ph.D., Florida State University.
- Paul J. Champagne** (1993; 1980). Professor of Management. A.B., Providence College; A.M., University of Hartford; Ph.D., University of Massachusetts.
- Allison T. Chappell** (2005; 2005). Assistant Professor of Sociology and Criminal Justice. B.S., East Carolina University; M.A., Ph.D., University of Florida.
- Dean C. Chatfield** (2006; 2006). Assistant Professor of Information Technology/Decision Sciences. B.S., Rensselaer Polytechnic Institute; M.B.A., M.S., Ph.D., The Pennsylvania State University.
- Sushil K. Chaturvedi** (1991; 1978). Professor of Mechanical Engineering. B.S., Indian Institute of Technology (India); M.S., Case Institute of Technology; Ph.D., Case Western Reserve University.
- Jie Chen** (2004; 1997). Professor of Political Science and Geography and Louis I. Jaffe Professor of Arts & Letters. B.A., Institute of International Politics (China); M.A., Monterey Institute of International Studies; Ph.D., Washington State University.
- Yi-Fan Chen** (2008; 2008). Assistant Professor of Communication and Theatre Arts. B.A., National Cheng-Kung University (Taiwan); M.A.J., M.A., Marshall University; Ph.D., Rutgers University.
- Teresa M. Christensen** (2007; 2006). Associate Professor of Counseling and Human Services. B.A., Adams State College; M. Coun., Ph.D., Idaho State University.
- Eva G. Clarke** (2006; 1992; 2006). Lecturer of Psychology. B.S., M.S., Old Dominion University.
- Michael L. Clemons** (1999; 1993). Associate Professor of Political Science and Geography. B.A., M.A., University of Maryland-College Park; Ph.D., Atlanta University.
- Sheri R. Colberg-Ochs** (2009; 1997). Professor of Human Movement Sciences. B.A., Stanford University; M.A., University of California at Davis; Ph.D., University of California at Berkeley.
- Christopher B. Colburn** (1993; 1987). Associate Professor of Economics. B.A., M.A., Ph.D., Texas A&M University.
- Faye E. Coleman** (1984; 1978). Associate Professor of Medical Laboratory and Radiation Sciences. B.S., Hampton Institute; M.S.M.T., St. John's University.
- Carol Considine** (2005; 1999). Associate Professor of Engineering Technology. B.S., Virginia Polytechnic Institute and State University; M.S., University of California at Berkeley.
- David P. Cook** (2003; 1997). Associate Professor of Information Technology/Decision Sciences. B.S.B.A., M.B.A., Bowling Green State University; Ph.D., University of Kentucky.
- Desmond C. Cook** (1996; 1981). Professor of Physics. B.Sc. (Honors), Ph.D., Monash University (Australia). Designated as a University Professor.
- John B. Cooper** (1999; 1993). Associate Professor of Chemistry and Biochemistry. B.S., The Citadel; Ph.D., North Carolina State University.
- Roland A. Cooper** (2009; 2002). Associate Professor of Biological Sciences. B.A., M.A., University of California - Santa Barbara; M.Sc., Harvard University School of Public Health; Ph.D., University of Arizona.
- Samuel F. Coppage** (1989; 1983). Associate Professor of Information Technology/Decision Sciences. B.S., Virginia State College; M.S., Ph.D., New York University.
- Rose Ann Corbin** (2005; 2003). Lecturer of Mathematics and Statistics. B.A., Grand Valley State University; M.A., Western Michigan University.
- Joseph P. Cosco** (2004; 1997; 1994). Associate Professor of English. A.B., Dartmouth College; M.A., Columbia University; Ph.D., The College of William and Mary.
- Matilda W. Cox** (2006; 1994). Senior Lecturer of English. B.A., M.A., Old Dominion University.
- Laurie M. Craigen** (2007; 2007). Assistant Professor of Counseling and Human Services. B.S., College of the Holy Cross; M.Ed., Ed.D., The College of William and Mary.
- Shawn S. Crawford** (2002; 2002). Instructor, Governor's School for the Arts. B.F.A., University of Mississippi; M.F.A., Carnegie Mellon University; M.F.A., University of Memphis.
- Jessica R. Crouch** (2005; 2005). Assistant Professor of Computer Science. B.S., University of Richmond; Ph.D., University of North Carolina at Chapel Hill.
- Karen S. Crum** (2006; 2006). Assistant Professor of Educational Foundations and Leadership. B.A., The College of William and Mary; M.A., Ed.D., The George Washington University.
- Jon R. Crunkleton** (1984; 1978). Associate Professor of Finance. B.S., Virginia Polytechnic Institute and State University; Ph.D., University of South Carolina.
- Roy R. Cunningham** (2001; 1991). Senior Lecturer of Marketing. B.A., University of Maryland; L.L.B., LaSalle University; M.S., University of Nebraska.
- Dawn M. Curran** (2007; 2006). Instructor of Medical Laboratory and Radiation Sciences. B.S., Alvernia College; B.S., Old Dominion University.
- Kimberly A. Curry-Lourenco** (2007; 2001). Senior Lecturer of Nursing. B.S.N., M.S.N., M.S.Ed., Old Dominion University.
- Gregory A. Cutter** (1994; 1982). Professor of Ocean, Earth, and Atmospheric Sciences. B.A., Revelle College, University of California at San Diego; Ph.D., University of California at Santa Cruz.
- Martha M. Daas** (2008; 2002). Associate Professor of Foreign Languages and Literatures. B.A., University of North Carolina - Chapel Hill; M.A., Ph.D., University of Texas - Austin.
- Kenneth Glenn Daley** (1979; 1965). Professor of Art. B.F.A., Philadelphia (Museum) College of Art; M.F.A., School of Art and Architecture of Yale University. Designated as a University Professor.
- Charles B. Daniels** (2008; 2008). Lecturer of Engineering Management and Systems Engineering. B.S., University of the State of New York; M.S., The George Washington University.
- Mona Danner** (2007; 1993). Professor of Sociology and Criminal Justice. B.A., University of Missouri-Kansas; M.A., Sam Houston State University; Ph.D., The American University.
- Dennis A. Darby** (1988; 1974). Professor of Ocean, Earth, and Atmospheric Sciences. B.S., M.S., University of Pittsburgh; Ph.D., University of Wisconsin at Madison.
- Michele Leonardi Darby** (1984; 1974). Professor of Dental Hygiene. B.S., M.S., Columbia University. Designated as an Eminent Scholar and University Professor.
- Daniel M. Dauer** (1987; 1975). Professor of Biological Sciences. B.S., Old Dominion University; Ph.D., University of South Florida. Designated as an Eminent Scholar. Joint appointment with the Department of Ocean, Earth, and Atmospheric Sciences.
- Donald D. Davis** (1987; 1982). Associate Professor of Psychology. B.S., M.S., Central Michigan University; Ph.D., Michigan State University.
- Shari A. Davis** (2003; 2001). Lecturer of Mathematics and Statistics. B.A., M.S.Ed., Queens College, City University of New York.
- Sharon R. Davis** (2009; 2002). Senior Lecturer of STEM Education and Professional Studies. B.S., M.S.Ed., Old Dominion University.
- Frank Patterson Day, Jr.** (1986; 1974). Professor of Biological Sciences. B.S., University of Tennessee; M.S., Ph.D., University of Georgia. Designated as an Eminent Scholar.
- Rebecca Randolph Deal** (2008; 2008). Lecturer of Nursing. B.A., B.S.N., University of Virginia; M.S.N.; Old Dominion University.
- Diana L. Deadrick** (1997; 1993). Associate Professor of Management. B.S., West Virginia Institute of Technology; M.B.A., Ph.D., Virginia Polytechnic Institute and State University.
- Anthony W. Dean** (2009; 2001). Associate Professor of Engineering Technology. B.S., Old Dominion University; M.B.A., The College of William and Mary; Ph.D., Old Dominion University.
- Dianne de Beixedon** (1980; 1974). Associate Professor of Art. A.B., Southern Illinois University; M.F.A., University of Georgia.
- Andrea DeBruin-Parecki** (2009; 2007). Associate Professor of Teaching and Learning. A.B., University of California at Berkeley; M.A.; Ph.D., University of Michigan.
- Robert Del Corso** (2008; 2008). Lecturer of History. B.A., John Carroll University; M.A., Naval Postgraduate School; M.R.E., Loyola University.
- Gianluca DeLeo** (2006; 2006). Assistant Professor of Medical Laboratory and Radiation Sciences. M.B.A., St. Louis University; M.S., Ph.D., University of Genoa (Italy).
- Berna Demiralp** (2005; 2005). Assistant Professor of Economics. B.A., Davidson College; M.A., Ph.D., Johns Hopkins University.
- Ayodeji O. Demuren** (1996; 1990). Professor of Mechanical Engineering. B.Sc., Ph.D., Imperial College London (England).
- Declan De Paor** (2008; 2008). Research Professor of Physics. B.Sc., National University of Ireland, Dublin; M.Sc., Ph.D., National University of Ireland, Cork.
- Valerian John Derlega** (1984; 1971). Professor of Psychology. A.B., City College of New York; Ph.D., University of Maryland.
- Carol V. DeRolf** (1974; 1974). Instructor, Child Study Center. A.B., Kearney State Teachers College; M.S. in Ed., Western Illinois University.
- Chandra R. de Silva** (1998; 1998). Dean of the College of Arts and Letters and Professor of History. B.A., University of Ceylon; Ph.D., University of London (United Kingdom).
- Shirshak K. Dhali** (2006; 2006). Professor of Electrical and Computer Engineering. B.Tech., Indian Institute of Technology (India); M.S., Ph.D., Texas Tech University.

- Amin N. Dharamsi** (1996; 1980). Professor of Electrical and Computer Engineering. B.S., University of Nairobi (Kenya); M.S., Ph.D., University of Alberta (Canada).
- Norou Diawara** (2006; 2006). Assistant Professor of Mathematics and Statistics. B.A., University of Cheick Anta Diop (Senegal); M.S., University of LeHarve (France); M.S., University of South Alabama; Ph.D., Auburn University.
- Rafael Diaz** (2008; 2008). Research Assistant Professor, Virginia Modeling, Analysis and Simulation Center. B.S., Jose Maria Vargas University (Venezuela); M.B.A., Ph.D., Old Dominion University.
- Daniel L. Dickerson** (2009; 2004). Associate Professor of STEM Education and Professional Studies. B.S., University of North Carolina at Chapel Hill; M.S., Ph.D., North Carolina State University.
- Gail K. Dickinson** (2006; 2004). Associate Professor of Teaching and Learning. B.S., Millersville University; M.S.L.S., University of North Carolina at Chapel Hill; Ph.D., University of Virginia.
- Fred C. Dobbs** (2006; 1993). Professor of Ocean, Earth, and Atmospheric Sciences. A.B., Franklin and Marshall College; M.S., University of Connecticut; Ph.D., Florida State University.
- Gail Dodge** (2006; 1995). Professor of Physics. B.A., Princeton University; M.S., Ph.D., Stanford University.
- Patricia M. Doherty** (1995; 1991). Lecturer of Accounting. B.S., Old Dominion University; M.B.A., Golden Gate University.
- Carol A. Doll** (2007; 2007). Professor of Teaching and Learning. B.A., Michigan State University; M.L.S., Western Michigan University; Ph.D., University of Illinois at Champaign-Urbana.
- John R. Donat** (1997; 1991). Associate Professor of Chemistry and Biochemistry. B.S., Humboldt State University; Ph.D., University of California at Santa Cruz. Joint appointment with the Department of Ocean, Earth, and Atmospheric Sciences.
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*Planned for discontinuation.