UF UNIVERSITY of FLORIDA GRADUATE SCHOOL

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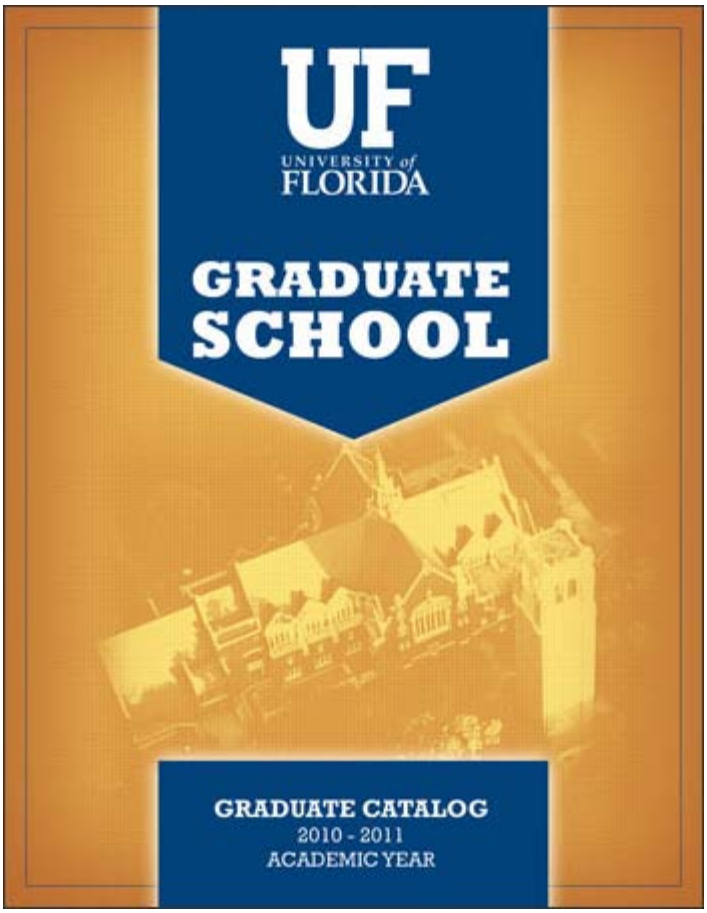

Publication Policy

Accreditation

The University of Florida is accredited by the Commission on

Colleges of the Southern Association of Colleges and Schools to award the degrees of bachelor, master, specialist, and engineer, as well as doctoral and professional degrees. It has 16 colleges and more than 150 interdisciplinary research and education centers, bureaus, and institutes. One hundred undergraduate degree programs are offered and the Graduate School coordinates more than 200 graduate programs throughout the University's colleges and schools. Professional postbaccalaureate degrees are offered in dentistry, law, medicine, pharmacy, public health, and veterinary medicine.

(1866 Southern Lane, Decatur, Georgia 30033-4097; telephone (404) 679-4501)

Equal Opportunity

The University encourages applications from qualified applicants of both sexes from all cultural, racial, religious, and ethnic groups. UF is committed to nondiscrimination with respect to race, creed, religion, age, disability, color, sex, sexual orientation, marital status, national origin, political opinions or affiliations, or veteran status in the administration of educational policies, financial aid, employment, or in any program or activity. Refer to the Office of Equal Opportunity Programs within UF's Human Resources Services for additional information; 352-392-1075.

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COMMITMENT TO DIVERSITY

The University of Florida is committed to creating a community that reflects the rich racial, cultural and ethnic diversity of the state and nation. No challenge that exists in higher education has greater importance than the challenge of enrolling students and hiring faculty and staff who are members of diverse racial, cultural or ethnic minority groups. This pluralism enriches the university community, offers opportunity for robust academic dialogue and contributes to better teaching and research. The university and its components benefit from the richness of a multicultural student body, faculty and staff who can learn from one another. Such diversity will empower and inspire respect and understanding among us. The university does not tolerate the actions of anyone who violates the rights of another person.

Through policy and practice, the university strives to embody a diverse community. Our collective efforts will lead to a university that is truly diverse and reflects the state and nation.

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ACADEMIC CALENDAR

To jump ahead to a specific term, please click on one of these links:

Fall 2010
Spring 2011
Summer 2011

Fall 2010

2010

August 6, Friday, 5:00 p.m.

Deadline if requesting transfer of credit (for fall degree candidates).

August 19-20, Thursday-Friday, ends at 5:00 p.m. on Friday

Registration

August 23, Monday

Drop/add starts.

Late registration starts (late fee assessed).

August 27, Friday, 11:59 p.m.

Drop/add ends.

Late Registration ends (late fee assessed).

Deadline to withdraw with no fee liability.

September 3, Friday, 3:30 p.m.

Fee payment deadline.

Residency reclassification deadline for receiving the request and all documents.

September 6, Monday, Labor Day

No classes.

September 10, Friday, 5:00 p.m.

Deadline for Graduate Student Records to review S/U option applications for courses approved with this grading scheme.

September 17, Friday, 5:00 p.m.

Deadline to withdraw with 25% refund (W symbol assigned). http://www.registrar.ufl.edu/pdf/withdrawal.pdf or 222 Criser Hall

Degree application deadline for degree award this term: https://gradschool.ufl.edu/downloads/graduation-checklist.pdf http://www.isis.ufl.edu/

October 8, Friday, 5:00 p.m.

Last day to submit dissertation for review by Graduate School Editorial Office: http://gradschool.ufl.edu/pdf-files/checklist-dissertation.pdf

October 14, Thursday

Midpoint of term.

Deadline to finalize all data (except Final Exam) in GIMS for all degree applicants.

Late degree application deadline for degree award this term. https://gradschool.ufl.edu/downloads/graduation-checklist.pdf

October 15-16, Friday - Saturday, Homecoming

No classes.

November 3, Wednesday, 5:00 p.m.

Last day to submit successfully defended thesis for review by Graduate School Editorial Office. http://gradschool.ufl.edu/pdf-files/checklist-thesis.pdf

November 11, Thursday, Veterans Day

No classes.

November 22, Monday

Last day to withdraw (all courses) without failing grades. http://www.registrar.ufl.edu/pdf/withdrawal.pdf or 222 Criser Hall

November 25-27, Thursday-Saturday, Thanksgiving

No classes.

December 6, Monday, 5:00 p.m.

Deadline for final exam forms to be posted to GIMS.

Deadline for theses and dissertation students to achieve Final Clearance status with the Graduate School Editorial Office in order to qualify for degree award this term.

December 8, Wednesday

Classes end.

Deadline if requesting transfer of credit (for spring degree candidates).

December 9-10, Thursday-Friday

Examination reading days (no classes).

December 11, Saturday, 13-17, Monday-Friday

Final examinations.

December 17, Friday

Last day to drop a course and receive W on transcript.

December 17-18, Friday-Saturday

Commencement.+

December 20, Monday, 12:00 noon

Final term grades are due.

December 21, Tuesday

Degree certification.

December 22, Wednesday

Unofficial transcripts with grades and remarks available 8:00 a.m. via ISIS.

Spring 2011

2010

December 8, Wednesday

Deadline if requesting transfer of credit (for spring degree candidates).

2011

January 4, Tuesday, 5:00 p.m.

Registration.

January 5, Wednesday

Classes start.

Drop/add starts.

Late registration starts (late fee assessed).

January 11, Tuesday, 11:59 p.m.

Drop/add ends

Late Registration ends (late fee assessed).

Deadline to withdraw with no fee liability.

January 14, Friday, 3:30 p.m.

Fee payment deadline.

Residency reclassification deadline for receiving requests and all documents.

January 17, Monday, Martin Luther King Jr. Day

No classes.

January 21, Friday, 5:00 p.m.

Deadline for Graduate Student Records to review S/U option applications for courses approved with this grading scheme.

January 28, Friday, 5:00 p.m.

Degree application deadline for degree award this term:
https://gradschool.ufl.edu/downloads/graduation-checklist.pdf
http://www.isis.ufl.edu/

Deadline to withdraw with 25% refund (W symbol assigned).

Degree application deadline for degree award this term:
http://www.registrar.ufl.edu/pdf/withdrawal.pdf or 222 Criser Hall

February 18, Friday, 5:00 p.m.

Last day to submit dissertation for review by Graduate School Editorial Office: http://gradschool.ufl.edu/pdf-files/checklist-dissertation.pdf

February 24, Thursday

Midpoint of term.

Deadline to finalize all data (except Final Exam) in GIMS for all degree applicants.

Late degree application deadline for degree award this term. https://gradschool.ufl.edu/downloads/graduation-checklist.pdf

March 5-12, Saturday-Saturday, Spring Break

No classes.

March 18, Friday, 5:00 p.m.

Last day to submit successfully defended thesis for review by Graduate School Editorial Office. https://gradschool.ufl.edu/downloads/graduation-checklist.pdf

April 8, Friday

Last day to withdraw (all courses) without failing grades. http://www.registrar.ufl.edu/pdf/withdrawal.pdf or 222 Criser Hall

April 18, Monday, 5:00 p.m.

Deadline for final exam forms to be posted to GIMS.

Deadline for theses and dissertation students to achieve Final Clearance status with the Graduate School Editorial Office in order to qualify for degree award this term.

April 20, Wednesday

Classes end.

Deadline if requesting transfer of credit (for summer degree candidates).

April 21-22, Thursday-Friday

Examination reading days (no classes).

April 23, Saturday, 25-29, Monday-Friday

Final examinations.

April 28-30, Thursday-Saturday, and May 1, Sunday

Commencement+

April 29, Friday

Last day to drop a course and receive W on transcript.

May 2, Monday, 12:00 noon

Final term grades are due.

May 3, Tuesday

Degree certification.

May 4, Wednesday

Unofficial transcripts with grades and remarks available 8:00 a.m. via ISIS.

Summer 2011

All Summer 2011 graduate-level degrees will be awarded at the end of Summer B/C (August 2011).

Applicants will select Summer B/C 2011 on the degree application menu in ISIS.

The Summer 2011 degree application will be available through ISIS in mid-March 2011.

For those students enrolled only in Summer A courses, you will still apply for the Summer B/C term, since graduate-level degrees are only awarded at the end of the B/C term. No graduate-level degrees are awarded at the end of Summer A (June). No late degree applications will be approved after the B/C deadline (June 29).

https://gradschool.ufl.edu/downloads/graduation-checklist.pdf
http://www.isis.ufl.edu/

April 20, Wednesday, 5:00 p.m.

Deadline if requesting transfer of credit (for summer degree candidates).

May 6, Friday, 5:00 p.m.

Summer A & C registration.

May 9, Monday

Summer A & C classes start.

Summer A & C drop/add starts.

Summer A & C late registration starts (late fee assessed).

May 10, Tuesday, 11:59 p.m.

Summer A & C late registration ends (late fee assessed).

Summer A & C drop/add ends.

Summer A & C deadline to withdraw with no fee liability.

May 18, Wednesday

Summer A deadline to withdraw with 25% refund (W symbol assigned): http://www.registrar.ufl.edu/pdf/withdrawal.pdf or 222 Criser Hall

Deadline for Summer A courses for Graduate Student Records to review S/U option applications for courses approved with this grading scheme.

May 20, Friday, 3:30 p.m.

Summer A & C fee payment deadline.

Summer A & C residency reclassification deadline for receiving the request and all documents.

May 27, Friday, 5:00 pm

Summer C deadline to withdraw with 25% refund (W symbol assigned): http://www.registrar.ufl.edu/pdf/withdrawal.pdf or 222 Criser Hall

Deadline for Summer C courses for Graduate Student Records to review S/U option applications for courses approved with this grading scheme.

May 30, Monday, Memorial Day observed

No classes.

June 10, Friday

Last day to withdraw (all courses) without failing grades for Summer A term: http://www.registrar.ufl.edu/pdf/withdrawal.pdf or 222 Criser Hall

June 17, Friday

Summer A classes end.

Summer A final examinations during regular class periods.

Last day to drop a course for Summer A and receive W on transcript.

Last day to submit dissertation for review by Graduate School

Editorial Office: http://gradschool.ufl.edu/pdf-files/checklist-dissertation.pdf

June 20, Monday, 12:00 p.m.

Summer A final term grades are due.

June 20-24, Monday-Friday, Summer Break

No classes.

June 22, Wednesday

Unofficial transcripts with grades and remarks available 8:00 a.m. via ISIS.

June 24, Friday, 5:00 p.m.

Summer B Registration.

June 27, Monday

Summer B classes start.

Summer B drop/add starts.

Summer B late registration starts (late fee assessed).

Midpoint of Summer term.

Deadline to finalize all data (except Final Exam) in GIMS for all degree applicants.

June 28, Tuesday, 11:59 p.m.

Summer B drop/add ends.

Summer B late registration ends (late fee assessed).

Summer B deadline to withdraw with no fee liability.

June 29, Wednesday

Summer B/C Degree application deadline — no exceptions will be granted after this date.

https://gradschool.ufl.edu/downloads/graduation-checklist.pdf
http://www.isis.ufl.edu/

July 4, Monday, Independence Day observed

No classes.

July 6, Wednesday, 5:00 p.m.

Summer B deadline to withdraw with 25% refund (W symbol

assigned): http://www.registrar.ufl.edu/pdf/withdrawal.pdf or 222 Criser Hall

Deadline for Summer B courses for Graduate Student Records to review S/U option applications for courses approved with this grading scheme.

Last day to submit successfully defended thesis for review by Graduate School Editorial Office: http://gradschool.ufl.edu/pdf-files/checklist-thesis.pdf

July 8, Friday, 3:30 p.m.

Summer B fee payment deadline.

Summer B residency reclassification deadline for receiving the request and all documents.

July 27, Wednesday, 5:00 p.m.

Deadline for final exam forms to be posted to GIMS.

Deadline for theses and dissertation students to achieve Final Clearance status with the Graduate School Editorial Office in order to qualify for degree award this term.

July 29, Friday

Last day to withdraw (all courses) without failing grades for Summer B or C term: http://www.registrar.ufl.edu/pdf/withdrawal.pdf or 222 Criser Criser Hall

August 5, Friday

Summer B and C classes end.

Deadline if requesting transfer of credit (for fall degree candidates).

Final examinations are during regular class periods.

Last day to drop a course for Summer B and C terms and receive W on transcript.

August 6, Saturday

Commencement+

August 8, Monday, 12:00 noon

Summer B and C final term grades are due.

August 9, Tuesday

Degree certification.

August 10, Wednesday

Unofficial transcripts with grades and remarks available 8:00 a.m. via ISIS.

NOTE: Prospective students should contact the appropriate academic unit for admission application deadlines.

+ Projected dates. Notification of dates and times of ceremonies for colleges and schools will be sent to degree candidates as soon as plans are finalized. Please do not anticipate exact dates and times until notification is received.

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GRADUATE SCHOOL

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Graduate School Deans
Graduate Council
History

Organization

The Graduate School consists of the Dean, Associate Deans, Graduate Council, and the Graduate Faculty. General policies and standards of the Graduate School are established by the Graduate Faculty. Any policy change must be approved by the graduate dean(s) and the Graduate Council. The Graduate School is responsible for enforcing minimum general standards of graduate work in the University and for coordinating the graduate programs of the various colleges and divisions of the University. Responsibility for detailed operation of graduate programs is vested in individual colleges, schools, divisions, and academic units. In most colleges an associate dean or other administrator is directly responsible for graduate study in that college. The Graduate Council helps the Dean in being the agent of the Graduate Faculty for executing policy related to graduate study and associated research. The Council (chaired by the graduate dean) considers petitions and policy changes. A graduate program's academic unit appoints members of the Graduate Faculty, with approval of the graduate dean. All faculty members who serve on supervisory committees or who direct master's theses and doctoral dissertations must first be appointed to the Graduate Faculty. The academic unit determines

the level of duties for each Graduate Faculty member.

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GRADUATE DEANS

HENRY T. FRIERSON,
Ph.D. (Michigan State University), Dean of the Graduate School and Associate Vice President and Professor of Educational Psychology

KENNETH J. GERHARDT,
Ph.D. (Ohio State University), Senior Associate Dean of the Graduate School and Professor of Communicative Disorders

LAURENCE B. ALEXANDER,
J.D. (Florida State University), Ph.D. (Florida State University), Associate Dean of the Graduate School and Professor of Journalism and Communications

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GRADUATE COUNCIL (2010-2011)

HENRY T. FRIERSON,
Ph.D. (Michigan State University), Dean of the Graduate School and Associate Vice President

MICHAEL ANNABLE,
Ph.D. (Michigan State University), Professor of Environmental Engineering Sciences

VIRGINIA DODD,
Ph.D. (University of South Florida), Associate Professor of Health Education and Behavior

ARTHUR EDISON,
Ph.D. (University of Wisconsin--Madison), Associate Professor of Biochemistry and Molecular Biology

PETER HANSEN,
Ph.D. (University of Wisconsin--Madison), Professor of Animal Sciences

CHRISTOPHER JANISZEWSKI ,
Ph.D. (Northwestern University), Professor of Marketing

MAUREEN KELLER-WOOD,
Ph.D. (University of California--San Francisco), Professor of Pharmacodynamics

MICHAEL MARSISKE,
Ph.D. (Pennsylvania State University), Associate Professor of Clinical and Health Psychology

LISA MCELWEE-WHITE,
Ph.D. (California Institute of Technology), Professor of Chemistry

LESLIE ODOM,
D.M.A. (Eastman School of Music), Associate Professor of Music

CRAIG OSENBERG,
Ph.D. (Michigan State University), Professor of Zoology

JOYCE STECHMILLER,
Ph.D. (University of Florida), Associate Professor of Adult and Elderly Nursing

LEONARDO VILLALON,
Ph.D. (University of Texas--Austin), Associate Professor of Political Science

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History

Graduate study at UF existed while the University was still on its Lake City campus. However, the first graduate degrees, two Master of Arts with a major in English, were awarded on the Gainesville campus in 1906. The first Master of Science was awarded in 1908, with a major in entomology. The first programs leading to the Ph.D. were approved in 1930, and the first degrees were awarded in 1934, one with a major in chemistry and the other with a major in pharmacy. The first Ed.D. was awarded in 1948. Graduate study has grown phenomenally at UF. In 1930, 33 degrees were awarded in 12 fields. In 1940, 66 degrees were awarded in 16 fields. In 2008-09, UF awarded 4344 graduate degrees in more than 100 fields, including 663 Ph.D. degrees.

Graduate Deans and Years of Service

May 2007 to Present: Henry T. Frierson, Dean
2004-2007: Kenneth J. Gerhardt, Interim Dean
1999-2004: Winfred M. Phillips, Dean
1998-1999: M. Jack Ohanian, Interim Dean
1993-1998: Karen A. Holbrook, Dean
July-September 1993: Gene W. Hemp, Acting Dean
1985-1993: Madelyn M. Lockhart, Dean
1983-1985: Donald R. Price, Acting Dean
September 1982-January 1983: Gene W. Hemp, Acting Dean
1980-1982: Francis G. Stehli, Dean
1979-1980: F. Michael Wahl, Acting Dean
1973-1979: Harry H. Sisler, Dean
1971-1973: Alex G. Smith, Acting Dean

1969-1971: Harold P. Hanson, Dean
1952-1969: L. E. Grinter, Dean
1951-1952: C. F. Byers, Acting Dean
1938-1951: T. M. Simpson, Dean
1930-1938: James N. Anderson, Dean

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GRADUATE DEGREES AND PROGRAMS

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Other Master's Degrees
Requirements for Doctoral Degrees
Doctor of Philosophy
Doctor of Audiology
Doctor of Education
Doctor of Nursing Practice
Doctor of Plant Medicine
Specialized Graduate Degrees
Engineer
Specialist in Education
Nontraditional Programs
Concurrent Graduate Programs
Joint Degree Programs
State University System Programs
Interdisciplinary Graduate Concentrations and Certificates

Definitions

Degree is the title conferred by the University on completing the academic program, for example, Doctor of Philosophy. Some degrees include the name of the field of study (Master of Architecture, Master of Education). Others (Master of Arts, Master of Science) do not.

Program is the student's primary field of study. This is the student's major. Programs offered at UF are approved by the Graduate Council, Faculty Senate, Board of Trustees, and Florida Board of Governors (specialist and doctoral degrees). The degree and program name appear on the student's transcript. Available programs are identified under the degree name in the list of graduate degrees and programs.

Co-major is a course of study allowing two majors for one Ph.D. degree. Each co-major must be approved by the Graduate Council.

Concentration is a subprogram in a major. Concentrations offered at UF are approved by the Graduate Council. The concentration, degree, and program may appear on the student transcript.

Minor is a block of course work completed in any academic unit outside the major, if approved for master's or doctoral programs listed in this catalog. **If a student earns more than one course from an academic unit contributing to the major of another, the student is not eligible to earn a minor from the contributing academic unit.** If a minor is chosen, the supervisory committee must include a representative from the minor field. A minor requires at least 6 to 15 credits depending on the program. The minor appears on the student's transcript along with the program name and the degree awarded.

Specialization is an informal designation used by academic units to indicate areas of research or scholarly strength, and has no formal significance. Track and emphasis are similar unofficial terms. No tracks, emphases, or specializations appear in official lists in this catalog or on the student transcript.

Graduate certificate may be offered by an academic unit along with a graduate degree. The certificate indicates that the student took a required number of courses in a special area. It requires Graduate Council approval but is not listed on the student transcript.

Multi-college program is a degree program offered through more than one college.

Combined degree program is a combined bachelor's and master's degree program allowing an academically advanced undergraduate student to take graduate courses before completing the bachelor's degree and to count 12 graduate credits toward both degrees. Students admitted into a combined program will normally have above average GPAs and superior scores on the verbal, quantitative, and analytical writing portions of the GRE. Individual academic units determine whether a combined degree program is appropriate. Combined degree programs established before January 1, 2003, may have other requirements.

Cooperative degree program leads to a graduate degree awarded by UF with more than one institution authorized to provide course work.

Jointly conferred degree program leads to a graduate degree awarded jointly by UF and another institution.

Joint degree program is a course of study that leads simultaneously to a graduate degree and a professional degree (i.e., D.M.D., D.V.M., J.D., M.D., Pharm.D.). Normally 12 credits of professional courses are counted toward the graduate degree and 12 credits of graduate courses are counted toward the professional degree.

Individual academic units determine whether a joint degree program is appropriate. Joint programs established before January 1, 2003, may have other requirements.

Concurrent degree program is simultaneous study on an individualized basis that leads to two master's degrees in two different graduate programs or two master's degrees in the same major. Such a program is initiated by the student and requires prior approval of each academic unit and the Graduate School. If the student is approved to pursue two master's degrees, no more than 9 credits of course work from one degree program may be applied toward the second master's degree.

Catalog year refers to the rules in effect during the first year a degree-seeking student enrolls in a program; the set of requirements a student must fulfill. If the student takes time off, then the catalog year is the academic year of readmission.

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Listing of Degrees and Programs

See *Fields of Instruction* for specializations in the approved programs.

T=thesis or dissertation N=non-thesis or no dissertation. Degree names and correct abbreviations are listed in bold. Possible majors (if different than the degree name) are listed in normal type.

Possible concentrations that are not interdisciplinary are listed under the major in italics. Interdisciplinary concentrations can be found in the Interdisciplinary Concentrations section of this catalog.

Master of Accounting (M.Acc.) N

Master of Advertising (M.Adv.) T

Master of Agribusiness (M.AB.) N
- Food and Resource Economics

Master of Architecture (M.Arch.) T
- *Historic Preservation*
- *Sustainable Architecture*
- *Sustainable Design*

Master of Arts (M.A.)
- Anthropology T/N
- Art Education T
- Art History T
- Business Administration
  - *Insurance* T
  - *Marketing* T/N
- Classical Studies T
- Communication Sciences and Disorders T/N
- Criminology, Law and Society T/N
- Digital Arts and Sciences T
- Economics T/N

English T/N
French T/N
Geography T
Applications of Geographic Technologies
German T/N
History T/N
International Business T
Latin T
Latin American Studies T
Linguistics T/N
Mathematics T/N
Museology [Museum Studies] T
Philosophy T/N
Political Science T/N
International Development Policy and Administration
Political Campaigning
Public Affairs
Political Science – International Relations T/N
Psychology T/N
Religion T
Jewish Studies
Sociology T/N
Spanish T/N
Women's Studies T/N

Master of Arts in Education (M.A.E.) T

Majors are those listed for the Master of Education degree.

Master of Arts in Mass Communication (M.A.M.C.) T/N

Master of Arts in Teaching (M.A.T.) N

Anthropology
French
Latin
Latin American Studies
Mathematics
Political Science–International Relations
Spanish

Master of Arts in Urban and Regional Planning (M.A.U.R.P.) T

Master of Building Construction (M.B.C.) N

Building Construction
Sustainable Construction

Master of Business Administration (M.B.A.) N

Business Administration
Competitive Strategy
Entrepreneurship
Finance

General Business
Global Management
Graham-Buffett Security Analysis
Human Resource Management
Information Systems and Operations Management
International Studies
Latin American Business
Management
Marketing
Real Estate and Urban Analysis
Sports Administration

Master of Education (M.Ed.) N

Curriculum and Instruction
Early Childhood Education
Educational Leadership
Educational Psychology
Elementary Education
English Education
Foreign Language Education
Foundations of Education
Marriage and Family Counseling
Mathematics Education
Mental Health Counseling
Reading Education
Research and Evaluation Methodology
School Counseling and Guidance
School Psychology
Science Education
Social Studies Education
Special Education

Master of Engineering (M.E.) T/N

Aerospace Engineering
Agricultural and Biological Engineering
Biomedical Engineering
Chemical Engineering
Civil Engineering
Coastal and Oceanographic Engineering
Computer Engineering
Electrical and Computer Engineering
Environmental Engineering Sciences
Industrial and Systems Engineering
Materials Science and Engineering
Mechanical Engineering
Nuclear Engineering Sciences

Master of Family, Youth and Community Sciences (M.F.Y.C.S.) N

Community Studies
Family and Youth Development
Nonprofit Organizations Development

Master of Fine Arts (M.F.A.) [T]
- Art
- Creative Writing
- Theatre

Master of Fisheries and Aquatic Sciences (M.F.A.S.) [N]

Master of Forest Resources and Conservation (M.F.R.C.) [N]
- Forest Resources and Conservation
- Geomatics

Master of Health Administration (M.H.A.) [N]

Master of Health Science (M.H.S.) [T/N]
- Occupational Therapy
- Rehabilitation Counseling

Master of Historic Preservation (M.H.P) [T]

Master of Interior Design (M.I.D.) [T]

Master of International Construction Management (M.I.C.M.) [N]

Master of Landscape Architecture (M.L.A.) [T]

Master of Latin (M.L.) [N]

Master of Laws (LL.M.)
- Comparative Law [N]
- Environmental and Land Use Law[N]
- International Taxation[N]
- Taxation[N]

Master of Music (M.M.) [T]
- Music
  - *Choral Conducting*
  - *Composition*
  - *Instrumental Conducting*
  - *Music History and Literature*
  - *Music Theory*
  - *Performance*
  - *Sacred Music*
- Music Education

Master of Occupational Therapy (M.O.T.) [N]

Master of Public Health (M.P.H.) [N]
- *Biostatistics*
- *Environmental Health*
- *Epidemiology*
- *Health Management and Policy*
- *Public Health Practice*
- *Social and Behavioral Sciences*

Master of Science (M.S.)

- Aerospace Engineering T/N
- Agricultural and Biological Engineering T/N
- Agricultural Education and Communication T/N
  - *Farming Systems*
- Agronomy T/N
- Animal Molecular and Cellular Biology T
- Animal Sciences T
- Applied Physiology and Kinesiology T/N
  - *Athletic Training/Sport Medicine*
  - *Biobehavioral Science*
  - *Clinical Exercise Physiology*
  - *Exercise Physiology*
  - *Human Performance*
- Astronomy T/N
- Biochemistry and Molecular Biology T/N
- Biomedical Engineering T/N
- Biostatistics T/N
- Botany T
- Business Administration T/N
  - *Marketing*
  - *Retailing*
- Chemical Engineering T/N
- Chemistry T/N
- Civil Engineering T/N
- Coastal and Oceanographic Engineering T/N
- Computer Engineering T/N
- Computer and Information Sciences T/N
- Dental Sciences T
  - *Endodontics*
  - *Orthodontics*
  - *Periodontics*
  - *Prosthodontics*
- Digital Arts and Sciences T
- Electrical and Computer Engineering T/N
- Entrepreneurship T/N
- Entomology and Nematology T/N
- Environmental Engineering Sciences T/N
- Epidemiology T
  - *Biostatistics*
  - *Health Management Policy*
- Family, Youth, and Community Sciences T
  - *Community Studies*
  - *Family and Youth Development*
  - *Nonprofit Organizations Development*
- Finance T/N
- Fisheries and Aquatic Sciences T

Food and Resource Economics T/N

Food Science and Human Nutrition T/N

Forest Resources and Conservation T

Geomatics

Geography T

Applications of Geographic technologies

Geographic Information Systems

Geology T

Health Education and Behavior T/N

Horticultural Science T/N

Environmental Horticulture

Horticultural Sciences

Industrial and Systems Engineering T/N

Information Systems and Operations Management T/N

Supply Chain Management

Interdisciplinary Ecology T/N

Management T/N

Health Care Risk Management

Geriatric Care Management

Marketing T

Materials Science and Engineering T/N

Mathematics T/N

Mechanical Engineering T/N

Medical Sciences T

Clinical Investigation

Microbiology and Cell Science T/N

Nuclear Engineering Sciences T/N

Physics T/N

Plant Molecular and Cellular Biology T/N

Plant Pathology T/N

Psychology T/N

Real Estate T/N

Recreation, Parks, and Tourism T/N

Campus Recreation

Recreation Administration and Supervision

Recreation Resource Planning and Management

Tourism and Commercial Recreation

Soil and Water Science T/N

Sport Management T/N

Veterinary Medical Sciences T/N

Forensic Toxicology

Wildlife Ecology and Conservation T/N

Zoology T/N

Master of Science in Architectural Studies (M.S.A.S.) T

Historic Preservation

Sustainable Architecture
Sustainable Design

Master of Science in Building Construction (M.S.B.C.) [T]
Building Construction
Sustainable Construction

Master of Science in Nursing (M.S.Nsg.) [T/N]
Nursing
Midwifery

Master of Science in Pharmacy (M.S.P.) [T/N]
Pharmaceutical Sciences
Forensic Drug Chemistry
Forensic Science
Forensic Serology and DNA
Medicinal Chemistry
Pharmacodynamics
Pharmacy
Pharmaceutical Outcomes and Policy

Master of Science in Statistics (M.S.Stat.) [T]

Master of Science in Teaching (M.S.T.) [N]
Astronomy
Botany
Chemistry
Geography
Geology
Mathematics
Physics
Zoology

Master of Statistics (M.Stat.) [N]

Engineer (Engr.)[T/N]

A special degree requiring 1 year of graduate work beyond the master's degree. For a list of the approved majors, see those listed for the Master of Engineering degree, except Biomedical Engineering, Civil Engineering, and Coastal and Oceanographic Engineering.

Specialist in Education (Ed.S.) [N]

A special degree requiring 1 year of graduate work beyond the master's degree. For a list of the approved programs, see those listed for the Doctor of Education degree.

Doctor of Audiology (Au.D.) [N]

Doctor of Education (Ed.D.) [T]
Curriculum and Instruction
Educational Leadership
Educational Policy
Educational Psychology

Foundations of Education
Higher Education Administration
Educational Policy
Marriage and Family Counseling
Mental Health Counseling
Research and Evaluation Methodology
School Counseling and Guidance
School Psychology
Special Education

Doctor of Nursing Practice (D.N.P.) [N]

Doctor of Philosophy (Ph.D.) [T]

Aerospace Engineering
Agricultural and Biological Engineering
Agricultural Education and Communication
Agronomy
Animal Molecular and Cellular Biology
Animal Sciences
Anthropology
Art History
Astronomy
Biochemistry and Molecular Biology
Imaging Science and Technology
Mammalian Genetics
Biomedical Engineering
Biostatistics
Botany
Business Administration
Accounting
Finance
Information Systems and Operations Management
Insurance
Management
Marketing
Real Estate and Urban Analysis
Chemical Engineering
Chemistry
Imaging Science and Technology
Civil Engineering
Classical Studies
Coastal and Oceanographic Engineering
Communication Sciences and Disorders
Computer Engineering
Counseling Psychology
Criminology, Law and Society
Curriculum and Instruction
Design, Construction, and Planning
Economics
Educational Leadership
Educational Policy
Educational Psychology

Electrical and Computer Engineering
English
Entomology and Nematology
Environmental Engineering Sciences
Epidemiology
Fisheries and Aquatic Sciences
Food and Resource Economics
Food Science and Human Nutrition
- *Food Science*

Forest Resources and Conservation
- *Geomatics*

Foundations of Education
Genetics and Genomics
Geography
Geology
German
Health and Human Performance
- *Biobehavioral Science*
- *Exercise Physiology*
- *Health Behavior*
- *Recreation, Parks, and Tourism*
- *Sport Management*
- *Tourism*

Health Services Research
Higher Education Administration
- *Educational Policy*

History
Horticultural Science
- *Environmental Horticulture*
- *Horticulture Sciences*

Industrial and Systems Engineering
Interdisciplinary Ecology
Linguistics
Marketing
Marriage and Family Counseling
Mass Communication
Materials Science and Engineering
Mathematics
Mechanical Engineering
Medical Sciences
- *Biochemistry and Molecular Biology*
- *Genetics*
- *Immunology and Microbiology*
- *Molecular Cell Biology*
- *Neuroscience*
- *Physiology and Pharmacology*
- *Toxicology*

Mental Health Counseling
Microbiology and Cell Science
Molecular Genetics and Microbiology
- *Mammalian Genetics*

- Music
  - *Composition*
  - *Music History and Literature*
- Music Education
- Nuclear Engineering Sciences
- Nursing Sciences
- Nutritional Sciences
- Pharmaceutical Sciences
  - *Medicinal Chemistry*
  - *Medicinal Chemistry and Toxicology*
  - *Pharmacodynamics*
  - *Pharmacy*
  - *Pharmaceutical Outcomes and Policy*
  - *Public Affairs*
  - *Toxicology*
- Philosophy
- Physics
- Plant Molecular and Cellular Biology
- Plant Pathology
- Political Science
  - *Educational Policy*
- Psychology
  - *Clinical and Health Psychology*
  - *Psychology*
- Rehabilitation Science
- Religion
- Research and Evaluation Methodology
- Romance Languages and Literatures
  - *French*
  - *Spanish*
- School Counseling and Guidance
- School Psychology
- Sociology
- Soil and Water Science
- Special Education
- Statistics
- Veterinary Medical Sciences
- Wildlife Ecology and Conservation
- Zoology

Doctor of Plant Medicine (D.P.M.) [N]

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Requirements for Master's Degrees

The master's degree is conferred only on completing a coherent and focused program of advanced study. Each academic unit sets its own minimum degree requirements beyond the minimum required by the Graduate Council.

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General Regulations for Master's Degrees

Graduate School regulations are as follows. Colleges and academic units may have additional regulations beyond those stated below. **Unless otherwise indicated in the next sections on master's degrees, these general regulations apply to all master's degree programs at the University.**

Course requirements: Graduate credit is awarded for courses numbered 5000 and above. The program of course work for a master's degree must be approved by the student's adviser, supervisory committee, or faculty representative of the academic unit. No more than 9 credits from a previous master's degree program may apply toward a second master's degree. These credits are applied only with the written approval of the Dean of the Graduate School.

Major: Work in the major must be in courses numbered 5000 or above. For work outside the major, 6 credits of courses numbered 3000 or above may be taken if part of an approved plan of study.

Minor: Minor work must be in an academic unit other than the major. If a student earns more than one course from an academic unit contributing to the major of another, the student is not eligible to earn a minor from the contributing academic unit. If a minor is chosen, at least 6 credits of work are required in the minor field. Two 6-credit minors may be taken with the major academic unit's permission. A 3.00 (truncated) GPA is required for minor credit.

Degree requirements: Unless otherwise specified, for any master's degree, the student must earn at least 30 credits as a graduate student at UF. No more than 9 of the 30 credits (earned with a grade of A, A-, B+, or B) may be transferred from institutions approved for this purpose by the Dean of the Graduate School. At least half of the required credits (not counting 6971) must be in the major.

Transfer of credit: Only graduate-level (5000-7999) work with a grade of B or better, is eligible for transfer of credit. A maximum of 15 transfer credits are allowed. These can include no more than 9 credits from institution/s approved by UF, with the balance obtained from postbaccalaureate work at the University of Florida. Credits transferred from other universities are applied toward the degree requirements, but grades earned are not computed in the student's grade point average. Acceptance of transfer of credit requires approval of the student's supervisory committee and the Dean of the Graduate School.

Petitions for transfer of credit for a master's degree must be made during the student's first term of enrollment in the Graduate School.

The supervisory committee is responsible for using established criteria to ensure the academic integrity of course work before accepting graduate transfer credits.

Supervisory committee: The student's supervisory committee must be appointed as soon as possible after the student is admitted to the Graduate School and no later than the second term of graduate study.

Supervisory committees for graduate degree programs are initiated by the student, nominated by the respective academic unit chair, approved by the college dean, and appointed by the Dean of the Graduate School. The Dean of the Graduate School is

an ex-officio member of all supervisory committees. Only Graduate Faculty may serve on a supervisory committee. If a student takes fewer than 12 credits in the first term, the deadline is the end of the term during which the student has accumulated 12 or more credits or the end of the second term. If a minor is designated for any degree, a representative from that minor is needed on the supervisory committee. If two minors are designated, two representatives are needed.

The supervisory committee for a master's degree with a thesis should consist of at least two Graduate Faculty members, unless otherwise specified. If a minor is designated, the committee must include a Graduate Faculty member from the minor department.

A supervisory committee for a master's degree without thesis is not required by the Graduate School but may be required by the academic unit. If a minor is designated for a non-thesis degree, the name of the minor representative must be submitted to the Graduate School via the Graduate Information Management System (GIMS).

Language requirements: (1) Each academic unit determines whether a reading knowledge of a foreign language is required. The requirement varies from one academic unit to another, and the student should check with the appropriate academic unit for specific information. (2) All candidates must be able to use the English language correctly and effectively, as judged by the supervisory committee.

Examination: Each candidate must pass a final comprehensive examination. Some programs use different terminology, such as *capstone course*. This examination must cover at least the candidate's field of concentration. It must occur no earlier than the term before the degree is awarded. The comprehensive examination for the non-thesis master's degree may be taken at a remote site. All other examinations must be held on campus.

Time limitation: All work (including transferred credit) counted toward the master's degree must be completed within 7 years before the degree is awarded.

Leave of absence: Any student who will not register at UF for a period of more than 1 term needs prior written approval from the supervisory committee chair for a leave of absence for a designated period of time. This approval remains in the student's departmental file. The Graduate School does not require notification. The student must reapply for admission on return. See *Readmission* and *Catalog Year*.

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Master of Arts and Master of Science

The general requirements for the Master of Arts and the Master of Science degrees also apply to the following degrees: Master of Arts in Education, Master of Arts in Mass Communication, Master of Science in Building Construction, Master of Science in Pharmacy, and Master of Science in Statistics. There are additional requirements for specialized degrees.

Course requirements: A master's degree with thesis requires at least 30 credits including up to 6 credits of Research for Master's Thesis (6971). All thesis students must register for an appropriate number of credits in 6971.

A non-thesis Master of Arts or Master of Science degree requires at least 30 credits. No more than 6 of those credits can be from S/U courses. Non-thesis students cannot use Research for Master's Thesis (6971).

For all master's programs, at least half the required credits (not counting 6971) must be in the major. One or two minors of at least 6 credits each may be taken, but a minor is not required by the Graduate School. Minor work must be in an academic unit other than the major.

Non-thesis M.S. engineering programs: Students in engineering, if working at off-campus centers, must take half the course work from full-time UF faculty members and must pass a comprehensive written examination by a committee recommended by the Dean of the College of Engineering and appointed by the Dean of the Graduate School. This written comprehensive examination may be taken at an off-campus site.

Master's thesis requirements: Each master's thesis candidate must prepare and present a thesis that shows independent investigation and that is acceptable in form and content to the supervisory committee and to the Graduate School. The work must be of publishable quality and must be in a form suitable for publication, using the Graduate School's format requirements. The academic unit is responsible for quality and scholarship. Graduate Council requires the Graduate School Editorial Office, as agents of the Dean of the Graduate School, to briefly review theses and dissertations for acceptable format, and to make recommendations as needed.

Format requirements:
http://gradschool.ufl.edu/pdf-files/editorial-format.pdf
Format examples:
http://gradschool.ufl.edu/editorial/format.html#samples
Checklist:
http://gradschool.ufl.edu/pdf-files/checklist-thesis.pdf
Application Support Center/Electronic Theses and Dissertation Lab:
http://etd.helpdesk.ufl.edu
Graduate School Editorial Office:
http://gradschool.ufl.edu/editorial/introduction.html#contacts

Gatorlink e-mail requirement: UF requires students to maintain access to their Gatorlink e-mail accounts. Accordingly, the Editorial Office only communicates with students through official Gatorlink e-mail.

Thesis first submission: When first presented to the Graduate School Editorial Office, the thesis must be successfully defended. Directly after the defense, the Academic Unit must submit the Final Exam Form and the UF Publishing Agreement through the Graduate School Information Management System (GIMS). The thesis should be virtually complete and completely formatted (not a draft). Students must be completely familiar with the format requirements of the Graduate School Editorial Office and should work with the consultants in the Applications Support Center to troubleshoot their documents before submitting the document for review by one of the Editors in the Graduate School Editorial Office (see Deadlines section of this catalog). Students who do not first meet with the Lab Consultants often find their document rejected upon first submission to the Editorial Office, for not meeting the minimum submission standards.

The Editorial Office e-mails the student, using their Gatorlink email address, confirming the submission, and responding with either an acceptance or denial submission e-mail. Another e-mail is sent when the thesis has been reviewed. The student is responsible for retrieving the marked thesis, review comments, and resolving any deficits related to the format requirements. Students should promptly make all needed changes.

Uploading and submitting the final pdf: After changes have been made to the satisfaction of the supervisory committee, the Electronic Thesis or Dissertation (ETD) Signature Page is submitted electronically, via the Graduate Information Management System (GIMS). This data is then transmitted to the Graduate School Editorial Office. This allows the student to upload and submit the final pdf of the electronic thesis using the Editorial Document Management (EDM) system. The document undergoes a a final review by one of the Graduate School Representatives. The Editorial Office ensures that the format is acceptable, that all indicated changes were made, and that all of the hyperlinks work within the document. The Representative then e-mails the student regarding the status of the ETD (electronic thesis or dissertation). If accepted, no further changes are allowed to be made to the document. If changes are still required, the student should resubmit the corrected document as soon as possible, as all submissions must be accepted, and not simply submitted, by the Graduate School Editorial Office Final Clearance Deadline. Exceptions cannot be made to this deadline. When all changes have been made and approved, the Editorial Office emails the student with a message that they have achieved Final Clearance.

Editorial final clearance: Among other requirements (Checklist above), the final thesis must be accepted (not just submitted) by 5:00 p.m. on this deadline. Since there are hundreds of students concurrently completing the process, most students complete all requirements well in advance, in order to ensure they do not face the chance of not graduating in their intended term..

Copyright: The student is automatically the copyright holder, by virtue of having written the thesis. A copyright page should be included immediately after the title page to indicate this.

Thesis language: Theses must be written in English, except for students pursuing degrees in Romance or Germanic languages and literatures. Students in these disciplines, with the approval of their supervisory committees, may write in the topic language. A foreign language thesis should have the Acknowledgements, Abstract, and Biographical Sketch written in English. All page titles before Chapter 1 should also be in English.

Journal articles: A thesis may include journal articles as chapters, if all copyright considerations are addressed appropriately. In such cases, Chapter 1 is a general introduction, tying everything together as a unified whole. The last chapter contains the general conclusions, once again tying everything together into a unified whole. Any chapter representing a journal article requires a footnote at the bottom of the first page of the chapter: “Reprinted with permission from . . . ” giving the source, just as it appears in the list of references. The thesis must have only 1 abstract and 1 reference list.

Change from thesis to non-thesis option: Permission of the supervisory committee is needed to change from thesis to non-thesis option. This permission must be forwarded to the Graduate School by midpoint of the final term via the Graduate Information Management System (GIMS). The candidate must meet all the requirements of the non-thesis option as specified above. A maximum of 3 credits earned with a grade of S in 6971 (Research for Master's Thesis) can be counted toward the degree requirements only if converted to credit as A, A-, B+, or B in Individual Work. The supervisory committee must indicate that the work was productive in and by itself and that the work warrants credit as a special problem or special topic course.

Supervisory committee: The student's supervisory committee should be appointed as soon as possible after the student is admitted to the Graduate School and no later than the second term of graduate study. Supervisory committees for graduate degree programs are initiated by the student, nominated by the respective academic unit chair, approved by the college dean, and appointed by the Dean of the Graduate School. The Dean of the Graduate School is an ex-officio member of all supervisory committees. Only Graduate Faculty may serve on a supervisory committee. If a student takes fewer than 12 credits in the first term, the deadline is the end of the term during which the student has accumulated 12 or more credits or the end of the second term. If a minor is designated for any degree, a representative from that minor is needed on the supervisory committee. If two minors are designated, two representatives are needed.

Thesis final examination: When most of the student's course work is completed, and the thesis is in final form, the supervisory committee must examine the student orally or in writing on (1) the thesis, (2) the major subjects, (3) the minor or minors, and (4) matters of a general nature pertaining to the field of study.

The candidate and the supervisory committee chair or cochair must be present together at the same location. All other supervisory committee members may attend the defense remotely. The defense date must be fewer than 6 months before degree award. All forms should be signed at the defense: the candidate and the supervisory committee chair sign the UF Publishing Agreement form; and the entire supervisory committee signs the ETD Signature Page and the Final Examination Report. If thesis changes are requested, the supervisory Committee Chair or the Committee's designee may hold the ETD Signature Page, until all requirements are met regarding the thesis. Once all stipulations of the Committee members are satisfied, and before the Editorial Office's final clearance deadline for the term of intended degree award, verification of completion of this form must be submitted electronically via GIMS.

Non-thesis final comprehensive examination: Non-thesis students must pass a comprehensive written or oral examination on the major and on the minor if a minor is designated. This comprehensive examination must be taken no more than 6 months before the degree is awarded.

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Other Master's Degrees

Although the general requirements for the Master of Arts and the Master of Science degrees also apply to the following discipline-specific degrees, there are some

important differences. For detailed requirements, see *Fields of Instruction*. In addition, the Graduate School monitors the following requirements for these specialized degrees.

Master of Accounting

The Master of Accounting (M.Acc.) is the graduate degree for students seeking professional careers in public accounting, business organizations, and government. The M.Acc. program offers specializations in auditing/financial accounting, accounting systems, and taxation.

The recommended curriculum to prepare for a professional career in accounting is the 3/2 five-year program with a joint awarding of the Bachelor of Science in Accounting and the Master of Accounting degrees on satisfactory completion of the 150-credit program. The entry point into the 3/2 is the start of the senior year.

Students who have already completed an undergraduate degree in accounting may enter the 1-year M.Acc. program, which requires 34 credits of course work. At least 18 credits must be in graduate-level accounting, excluding preparatory courses. All students must take a final comprehensive examination. For details about requirements, see *General Regulations* for master's degrees.

M.Acc./J.D. program: This joint program culminates in both the Juris Doctor (J.D.) degree awarded by the College of Law and the Master of Accounting (M.Acc.) degree awarded by the Graduate School. The program is for students with an undergraduate degree in accounting, who are interested in advanced studies in both accounting and law. About 20 credits fewer are needed for the joint program than if the two degrees were earned separately. The two degrees are awarded after completing curriculum requirements for both degrees. Students must take the GMAT (or the GRE), and also the LSAT before admission, and must meet the admission requirements for the College of Law (J.D.) and the Fisher School of Accounting (M.Acc.).

Master of Advertising

The Master of Advertising (M.Adv.) program develops leaders in the profession by giving students theoretical, research, and decision-making skills essential for strategic advertising and integrated communications planning; and the opportunity to develop expertise in an area such as account management, research, creative strategy, media planning, international and cross cultural advertising, new technology, special market advertising, and advertising sales management.

Students without a basic course or substantial professional experience in marketing or advertising must complete articulation courses before entering the program. All students must complete a basic statistics course before entering. The M.Adv. requires at least 33 credits and a thesis. Some areas allow a terminal project in lieu of thesis (with permission from the academic unit's Graduate Faculty).

Students select a supervisory committee to guide selection of courses, selection of thesis topic (or project in lieu of thesis), and completion of the thesis or project. At least one committee member must be from the Department of Advertising's Graduate Faculty.

Students complete and orally defend their theses or projects. The student's

supervisory committee is responsible for evaluating the thesis or project and the final defense.

Master of Agribusiness

The Master of Agribusiness (M.Ab.) degree program offers advanced study for students seeking careers in sales, marketing, and management with organizations that operate mainly in the food industry and agribusiness sector. Through rigorous practical course work, students can capitalize on the program's broad-based resources, as students look forward to careers as food marketers, commodity merchandisers, and agribusiness managers. Students may focus on areas such as strategic sales, international marketing, human resource management, and the futures market. This program is not recommended for students seeking careers in research and university teaching.

The program requires at least 30 credits (core and elective courses in finance, marketing, management, decision-making, and quantitative methods relevant to agribusiness). These courses prepare students to analyze current situations, anticipate opportunities, and develop effective action plans. Before starting the program, students must have taken and successfully passed prerequisite courses in marketing, management, statistics, and finance. Contact the academic unit for information on additional prerequisite courses and program requirements.

Master of Architecture

The Master of Architecture (M.Arch) is an accredited graduate degree meeting the professional requirements of the National Architectural Accrediting Board for students who wish to qualify for registration and practice as architects. Candidates are admitted from architectural, related, and unrelated undergraduate backgrounds; professional experience is encouraged but not required.

The M.Arch. requires at least 52 credits, including no more than 6 credits in ARC 6971 or 6979. Course sequences in design history and theory, structures, technology, and practice must be completed. Students are encouraged to propose individual programs of study (outside of required courses), and interdisciplinary work is encouraged.

Master of Arts in Teaching and
Master of Science in Teaching

These degrees (M.A.T., M.S.T.) combine graduate study in a discipline with selected education courses and a teaching internship, providing flexible curricula that prepare students for a variety of options including teaching and further graduate work.

Requirements for the degrees are as follows:

(1) A reading knowledge of one foreign language if required by the student's major.

(2) Satisfactory completion of at least 36 credits while registered as a graduate student, with work distributed as follows:

— At least 18 credits in the major and 6 credits in the minor.

— Six credits in an academic unit internship in teaching (6943 Internship in College Teaching). Three years of successful teaching experience in a state-certified school may be substituted for the internship requirement, and credits thus made available may be used for further work in the major, the minor, or in education.

— At least one course selected from three or more of the following: social and/or psychological foundations of education; education technology; counselor education; special education, and community college curriculum. Other areas may be added or substituted at the discretion of the supervisory committee. These courses may be used to comprise a minor.

(3) Off-campus work: At least 8 to 16 credits (at the academic unit's discretion), including at least 6 credits in one term, must be earned on the Gainesville campus. Beyond that, credits earned in off-campus UF courses approved by the Graduate School are accepted if they are appropriate to the student's degree program as determined by the supervisory committee.

(4) At degree completion, the student needs at least 36 credits in the major for certification purposes.

(5) The student must pass a final comprehensive examination (written, oral, or both). This examination covers the field of concentration and the minor.

Master of Arts in Urban and Regional Planning

The degree of Master of Arts in Urban and Regional Planning (M.A.U.R.P.) is a graduate degree for professional urban and regional planners and meets the educational requirements for the American Institute of Certified Planners. The program is accredited by the Planning Accreditation Board. General requirements are the same as for other Master of Arts degrees with thesis, except that the minimum registration required is 52 credits including no more than 6 credits in URP 6971 or 6979. All areas allow a project (requiring 6 credits) in lieu of thesis (with permission from the academic unit's Graduate Faculty).

M.A.U.R.P./J.D. joint program: A 4-year program leading to the Juris Doctor and Master of Arts in Urban and Regional Planning degrees is offered under the joint auspices of the College of Law and the College of Design, Construction, and Planning, Department of Urban and Regional Planning. For students interested in the legal problems of urban and regional planning, this program blends law studies with relevant course work in the planning curriculum. Students receive both degrees at the end of a 4-year course of study whereas separate programs would require 5 years. Students must take the GRE and the LSAT before admission, must be admitted to both programs, and must complete the first year of law school course work before commingling law and planning courses. A thesis is required on completing the course work.

Interested students should apply to both the Holland Law Center and the Graduate School, noting on the application the joint nature of their admission requests. For more information on the program, contact the Holland Law Center and the Department of Urban and Regional Planning.

Master of Building Construction

The Master of Building Construction (M.B.C.) degree is for students pursuing advanced work in construction management, construction techniques, and research problems in the construction field.

General requirements are the same as for the Master of Science in Building Construction degree except that the M.B.C. requires at least 36 graduate credits. A thesis is not required. All candidates are required to pass a comprehensive examination at the completion of course work.

Joint Program: The M.B.C./J.D. program is offered in conjunction with the Levin College of Law.

Master of Business Administration

The Master of Business Administration (M.B.A.) degree gives students (1) conceptual knowledge for understanding the functions and behaviors common to business organizations and (2) analytical, problem-solving, and decision-making skills essential for effective management. Emphasis is on developing the student's capacities and skills for business decision making.

The traditional M.B.A. curriculum is structured so that students may extend their knowledge in a specialized field. The program offers certificate programs in auditing and informational technology, financial services, hospitality management, supply chain management, information systems and operations management, entrepreneurship and technology management, and global management, and concentrations in finance, security analysis, real estate, competitive strategy, marketing, entrepreneurship, information systems and operations management, management, global management, human resource management, Latin American business, international studies, and sports administration.

Admission: Applicants for admission must submit recent official scores from the Graduate Management Admission Test (GMAT) and official transcripts for all previous academic work. All program options require at least 2 years of full-time professional work experience performed after receiving an acceptable bachelor's degree, along with written essays and personal recommendations from employers. All qualified applicants are asked to interview as part of the admissions process. Applicants whose native, first language is not English must submit acceptable scores from one of the following: TOEFL (Test of English as a Foreign Language), IELTS (International English Language Testing System), MELAB (Michigan English Language Assessment Battery) or successful completion of the University of Florida English Language Institute program. Admission is competitive and class size is limited.

A heterogeneous student body is seen as an important asset of the program. Accordingly, the backgrounds of students include a wide range of disciplines and cultures. Although the curriculum assumes no previous academic work in business administration, enrolling students find introductory course work in statistics, calculus, and financial accounting beneficial.

For more specific information on other aspects of the program, contact the Office of Admissions, Florida M.B.A. Program, 134 Bryan Hall, P.O. Box 117152, Gainesville FL 32611-7152, or visit the website, http://www.floridamba.ufl.edu.

Course work: At least 48 qualified credits of course work are required for the 2-

year option, and 1-year Option A. The 1-year Option B requires 32 credits. Credits cannot be transferred from another institution or program.

Options

Traditional M.B.A. 2-year option: The traditional M.B.A. program requires 4 terms of continuous full-time study. The program starts only in the fall; many students spend the summer working at internships. This option requires at least 2 years of full-time, post-undergraduate work experience.

Traditional M.B.A. 1-year, Option A: Students with an acceptable bachelor's degree, which need not be in business, may complete this option in 12 months. The program starts in the summer and requires 48 acceptable credits and 2 years of post-undergraduate work experience.

Traditional M.B.A. 1-year, Option B: For students with recent, acceptable undergraduate degrees in business (completed within 7 years before starting the program), this option starts in July. Students take mostly electives during summer B, fall, and spring terms and graduate in May. This option requires 2 years of post-undergraduate work experience.

Executive M.B.A. option: A 20-month program for working professionals, students attend classes 1 extended weekend per month (Friday-Sunday). The program is divided into 5 terms, starts in August, and includes a 1-week international experience. The international study tour is a program requirement; students travel abroad in May for a week of experiential learning through lectures or discussions with local business and government leaders. The tour will include a combination of lectures, group projects and/or site visits. This option requires 8 years of post-undergraduate work experience, and students are expected to have people or project management responsibilities in their current positions.

M.B.A. for professionals 2-year option: This 27-month program starts in August and January and is for professionals who work full time while pursuing their degrees part time. Students attend classes 1 weekend per month (Saturday-Sunday) and must attend a 1-week in-residence elective class. This option requires 2 years of post-undergraduate work experience.

M.B.A. for professionals 1-year option: For students with acceptable undergraduate degrees in business (completed within 7 years before starting the program), this 16-month option starts in August. Students attend classes 1 weekend per month (Saturday-Sunday) and must attend a 1-week in-residence elective class. The first meeting includes a 1-week, on-campus foundations review of basic course work. This option requires 2 years of post-undergraduate work experience.

Internet M.B.A. 2-year option: This 27-month program starts in January and allows students with computers, through Internet access, to “attend” classes and interact with faculty and classmates via such technology as e-mail, DVD, streaming video, synchronous group discussion software, asynchronous class presentation software, and multimedia courseware. Students visit campus 1 weekend (Saturday-Sunday) every 4 months. This option requires 2 years of post-undergraduate work experience.

Internet M.B.A. 1-year option: For students with acceptable undergraduate

degrees in business (completed within 7 years before starting this program), this 16-month option starts in January and gives students and faculty the same interactive technology as the Internet M.B.A. 2-year option. Students visit campus 1 weekend (Saturday-Sunday) every 4 months. The first meeting includes a 1-week, on-campus foundations review of basic course work. This option requires 2 years of post-undergraduate work experience.

M.B.A. for professionals in South Florida option: This 24 month program starts during the summer. For professionals who wish to continue working full time while pursuing their degrees part time. Students attend classes once every 3 weeks (Saturday-Sunday) in Fort Lauderdale. This option requires 2 years of post-undergraduate work experience.

M.B.A./M.S. in medical sciences (biotechnology) program: Concurrent studies leading to the Master of Business Administration and Master of Science degrees, offered in cooperation with the College of Medicine, are in response to the needs of businesses engaged in biotechnological sciences. Both degrees can be obtained in 3 years. The program requires 1 year of science courses, 1 year of business courses, and a year devoted to research and electives in business and science. Research is done in one of the Interdisciplinary Center for Biotechnology Research core laboratories. Students must meet the admission and curriculum requirements of both degrees. Requirements of the M.B.A. program are those in effect when an applicant is admitted to the program. A student must at all times remain in good standing in both degree programs to remain in the M.B.A. program. This program requires 2 years of post-undergraduate work experience.

M.B.A./Ph.D. in medical sciences program: Concurrent studies leading to the Master of Business Administration and Doctor of Philosophy degrees are offered in cooperation with the College of Medicine. This 120-credit program trains research scientists to assume responsibilities as managers of biotechnical industries. Estimated time to complete both degrees is 5 to 7 years. Students must meet the admission and curriculum requirements of both programs. Requirements of the M.B.A. program are those in effect when an applicant is admitted to the program. This program requires 2 years of post-undergraduate work experience.

M.B.A./J.D. program: A program of joint studies leading to the Master of Business Administration and Juris Doctor degrees is offered under the joint auspices of the Warrington College of Business Administration and the Levin College of Law. Current M.B.A. or J.D. students must declare their intent to apply for the second degree during their first year. Applications are then due according to admission schedules for that year. Both degrees are awarded after a 4-year course of study. Students must take both the LSAT and the GMAT before admission and meet the admission and curriculum requirements of both degrees. Requirements of the M.B.A. program are those in effect when an applicant is admitted to the program. This program requires 2 years of post-undergraduate work experience.

M.B.A./Pharm.D. program in management and pharmacy administration: A program of concurrent studies culminating in both the Master of Business Administration and Doctor of Pharmacy degrees allows students interested in both management and pharmacy administration to obtain the appropriate education in both areas. Candidates must meet the entrance requirements and follow the entrance procedures of both the Warrington College of Business Administration and

the College of Pharmacy, and admission to the two programs must be simultaneous. The degrees may be granted after 5 years of study. Requirements of the M.B.A. program are those in effect when an applicant is admitted to the program. This program requires 2 years of post-undergraduate work experience.

M.B.A./M.I.M. program in international management: A dual degree program between the University of Florida (UF) and the American Graduate School of International Management (Thunderbird) makes it possible to earn both degrees after 3 years of study. Students start the program at UF and apply to Thunderbird in their first year. Requirements of the M.B.A. program are those in effect when an applicant is admitted to the program. This program requires 2 years of post-undergraduate work experience.

World Leadership M.B.A. option: A 16-month program for executives. The program is divided into 5 modules and starts in January. This consortium program will bring together top executives from all over the world to participate in a truly global M.B.A. experience. During the course of the program, students attend classes in three 2-week residencies and two 1-week residencies. These residencies will take place in 5 different countries (U.S., Belgium, U.K., India, and China). World Leadership M.B.A. graduates will earn a consortium Master of Business Administration degree from the University of Florida and Vlerick Leuven Gent Management School, plus a Master of Business Administration degree from Aston Business School. This program requires 10 years of post undergraduate work experience, and students are expected to have significant people or project management responsibilities in their current positions.

Exchange programs: The M.B.A. program offers second-year students exchange opportunities at numerous international universities. Currently, exchange programs exist with schools in Australia, Belgium, Brazil, Chile, China, Canada, Denmark, England, Finland, France, Germany, Italy, Japan, Korea, Liechtenstein, the Netherlands, Norway, Poland, Spain, Sweden, Taiwan, Thailand, and Turkey. For a complete list of exchange partners, see http://www.cba.ufl.edu/sb/intlprograms/uf/exchange.asp.

Master of Education

The Master of Education (M.Ed.) degree program meets the need for professional personnel to serve a variety of functions required in established and emerging educational activities of modern society. A thesis is not required.

All M.Ed. programs require at least 36 credits, with at least half of these credits earned in courses in the College of Education. Up to 6 credit earned from 3000- and 4000-level courses taken outside the academic unit may be counted toward the minimum requires for the degree provided they are part of an approved plan of study. (See also *General Requirements for Master's Degrees*.)

At least 16 credits must be earned while the student is enrolled as a graduate student in courses offered on the Gainesville campus of the University of Florida including registration for at least 6 credits in a single term. This requirement may deviate where distance education programs are considered.

Master of Engineering

Students may choose a thesis or non-thesis option for the Master of Engineering (M.E.) degree. To be eligible for admission to the M.E. program, students must have earned a bachelor's degree from an ABET-accredited college or they must complete articulation work for equivalence. Admission requirements of the Graduate School must be met. The College of Engineering may use the Fundamentals of Engineering examination in lieu of the GRE for admitting students into the non-thesis master's degree programs. Students who do not meet the ABET requirement may be admitted to the Master of Science program (see section on Master of Arts and Master of Science).

The non-thesis M.E. degree is a 30-credit course-work–only degree (practice-oriented project or capstone course may be included in the 30 credits). At least 15 credits must be in the student's major at the 5000 level or higher. For work outside the major, courses numbered 3000 or above (not to exceed 6 credits) may be taken if they are part of an approved plan of study. If a minor is chosen, at least 6 credits are required. Two 6-credit minors may be taken. At the discretion of individual engineering academic units, an oral or written examination may be required.

The thesis option requires 30 credits of course work, including up to 6 credits of 6971 (Research for Master's Thesis). At least 12 credits (not counting 6971) must be in the student's major. Courses in the major must be at the 5000 level or higher. For work outside the major, up to 6 credits of courses numbered 3000 or above may be taken if part of an approved plan of study. If a minor is chosen, at least 6 credits are required. Two 6-credit minors may be taken at the discretion of the academic unit. A comprehensive oral and/or written final examination is required.

An off-campus (distance learning) student who is a candidate for the non-thesis M.E. degree must take half the course work from full-time UF faculty members and must pass a comprehensive written examination administered by a committee from the academic unit. If the student has a minor, the committee must include a member representing that minor.

Master of Family, Youth, and Community Sciences

The Master of Family, Youth, and Community Sciences (M.F.Y.C.S.) degree prepares students for mid-level leadership positions in public and private organizations, agencies, and businesses that address the needs of families, youths, and communities. The program of study provides the student with a broad base of knowledge in the discipline. It includes required courses in the theoretical foundations of the discipline, public policy analysis, program planning and evaluation, nonprofit management and ethics for practitioners. This program requires at least 32 credit hours (half of which are electives the student selects with the supervisory committee). Completing the degree requires comprehensive written and oral examinations.

Master of Fine Arts

The Master of Fine Arts (M.F.A.) degree is offered with majors in art, creative writing, and theatre. Requirements are the same as for the Master of Arts with thesis, except the M.F.A. requires at least 60 credits (54 for creative writing), including 6 to 9 credits in 6971 (Research for Master's Thesis). Students in art and theatre substitute 6973 (Individual Project) creative work in lieu of the written thesis.

Admission: Applicants requesting admission to any of the programs should have an earned baccalaureate degree in the same or a closely related field from an accredited institution. Students must fulfill the admission requirements of their disciplines and the Graduate School's admission criteria. In cases where the undergraduate degree is not in the area chosen for graduate study, the student must demonstrate a level of achievement fully equivalent to the bachelor's degree in the chosen graduate field. A candidate deficient in certain areas must remove the deficiencies by successfully completing appropriate courses.

Art or theatre candidates also must submit a portfolio of the creative work, or must audition, before being accepted into the program. Creative writing candidates must submit 2 short stories, 2 chapters of a novel, or 6 to 10 poems. Three years of work in residence are usually needed to complete degree requirements. If deficiencies must be removed, the residency could be longer. See *Fields of Instruction* for Art, English, and Theatre.

Art: The M.F.A. degree with a major in art involves advanced visual research for those who wish to attain a professional level of proficiency in studio work. Specialization is offered in the studio areas of ceramics, creative photography, drawing, painting, printmaking, sculpture, graphic design, and digital media. For studio work, the M.F.A. is generally the terminal degree and is often the required credential for teachers of art in colleges and universities.

In addition to the general requirements above, students must take at least 60 credits. Requirements include 42 credits in studio courses (24 in specialization, 12 in electives, and 6 in ART 6973C); 6 credits in art history; 3 credits in teaching art in higher education (required if the student is to accept a teaching assistantship); 3 credits in aesthetics, criticism, or theory; and 6 credits of electives. The College requires the student to leave documentation of thesis project work for purposes of record, exhibition, or instruction.

Creative writing: The M.F.A. in creative writing develops writers of poetry and fiction by a series of workshops and literature seminars. Candidates are expected to produce a thesis (a manuscript of publishable poetry or fiction) at the end of the 3-year program. The degree requires 9 courses (4 workshops, 3 literature courses, and 2 electives), 3 reading tutorials, and a thesis: 48 credits in all. Students take at least 1 workshop each term. All of the literature courses cannot be in the same century. The electives may be literature seminars or workshops; 1 elective may be an approved graduate course outside the Department of English.

Theatre: The M.F.A. degree with a major in theatre is for those interested in production-oriented theatrical careers and teaching. Two specializations are offered: acting and design. The craft skills encompassed in the program are later applied in public and studio productions. The program requires 60 credits, including 18 credits of core classes, 17 credits of specialty training, an internship, and a project in lieu of thesis.

Master of Fisheries and Aquatic Sciences

The non-thesis Master of Fisheries and Aquatic Sciences (M.F.A.S.) program trains students in the technical aspects of fisheries and aquatic sciences emphasizing written and oral communication of scientific information. Requirements are the same

as for the Master of Science degree with the non-thesis option, except that the M.F.A.S. also requires a technical paper. The program requires at least 26 graduate credits of graded course work (at least 16 in the major). The final draft of the technical paper must be submitted to all supervisory committee members for approval at least 3 weeks before the scheduled date of the oral and written final examination.

Master of Forest Resources and Conservation

The Master of Forest Resources and Conservation (M.F.R.C.) degree is for additional professional preparation rather than primary research. Requirements are the same as those listed under *General Regulations* for master's degrees, except that the M.F.R.C. requires GRE scores of at least 500 verbal and 500 quantitative.

Work required: At least 32 credits of letter-graded course work with at least 12 credits of graduate course work in the major are required. A thesis is not required, but the student must complete a technical project in an appropriate field. This project may take various forms, such as a literature review, extension publication, video, training manual, or curriculum. The M.F.R.C. requires a final examination covering the candidate's entire field of study. The student must present the work to the supervisory committee in an on-campus public forum before the final examination.

Master of Health Administration

The Master of Health Administration (M.H.A.), offered by the College of Public Health and Health Professions, trains qualified individuals to become managers and leaders of health care organizations. The degree provides a core of business and analytical skills, concepts and knowledge specific to health administration, opportunities for application and synthesis, and exposure to the field of practice. The M.H.A. program admits students only in the fall term and requires full-time study for 2 years, plus a summer internship between the first and second years. The program requires a total of 63 credits.

Master of Health Science

The Master of Health Science (M.H.S.) degree, offered by the College of Public Health and Health Professions, provides exposure to health research and meets the need for leadership personnel in established and emerging health care programs. The College currently offers programs in occupational therapy and rehabilitation counseling.

There are three paths to enter occupational therapy and attain the Master of Health Science degree. The 4-term thesis option emphasizes research and is the appropriate route for (but not limited to) students seeking admission to the College of Public Health and Health Profession's Ph.D. program in rehabilitation science. The 3-term non-thesis option emphasizes research and advanced theories related to the practice of occupational therapy. Both options prepare leaders in the profession and require 36 credits. The third option, the distance learning program, is for working professionals to increase knowledge in emerging practice areas and leadership.

The rehabilitation counseling program meets the need for professional personnel to serve in various areas of rehabilitation counseling. The Department requires at least 52 academic credits for most students, including at least 49 credits in the major.

Some exceptionally well-qualified students may need fewer credits with approval of the program chair. Work in the major includes both practicum experiences and a full-time internship. Elective courses may complement the major and relate to the student's career plans. All candidates must pass a comprehensive examination. See *General Regulations* for requirements for all master's degrees.

Master of Interior Design

The Master of Interior Design (M.I.D.) allows students to direct their attention to a variety of topics including design pedagogy and processes; sustainable, safe, and secure environments; creative performance and innovation; and built heritage conservation.

Work required includes at least 36 credits (no more than 6 thesis credits). Required preparatory courses are in addition to the minimum credits for graduate work.

Master of International Construction Management

The Master of International Construction Management (M.I.C.M.) is a non-thesis, distance education, advanced degree program with a research report/project requirement offered by the Rinker School of Building Construction. The M.I.C.M. allows students with computer and Internet access to attend classes at any time, any place and to interact with faculty and classmates via the Internet.

Admissions: Applicants for admission must have:

— An undergraduate degree,

— At least 5 years of meaningful, supervisory-level construction management experience,

— Acceptable GRE scores

— A grade point average of 3.00 on a 4.0 scale,

— If an international student, an acceptable score on one of the following: TOEFL (Test of English as a Foreign Language: computer=213, paper=550, web=80), IELTS (International English Language Testing System: 6), MELAB (Michigan English Language Assessment Battery: 77), or successful completion of the UF English Language Institute program, and

— Sponsorship by the employer.

Work required: The M.I.C.M. prepares students to assume upper-level construction management responsibilities in a multinational construction company. Specializations include sustainable construction, information systems, construction safety, and human resource management. In addition to 6 research-oriented graduate credits, the student selects 1 or 2 specializations and then takes the rest of the required 33 credits from the remaining courses and special electives. Students must pass a comprehensive oral and/or written examination on completing course work and the master's research report/project.

Master of Landscape Architecture

The degree of Master of Landscape Architecture (M.L.A.) is the advanced professional degree for graduates with baccalaureate credentials in landscape architecture and is a first professional degree for the graduate from a nonlandscape architectural background. Candidates are admitted from related and unrelated fields and backgrounds. An advanced professional life experience track is available for eligible candidates.

Work required: Candidates must complete at least 52 credits, including no more than 6 credits of thesis or project. For students without baccalaureate credentials in landscape architecture, required preparatory courses are in addition to the minimum credits for graduate work. For advanced professional life experience candidates, the minimum requirement is 30 credits, including thesis. At least 50% of all course work must be graduate courses in landscape architecture. Some areas allow a project (requiring 6 credits) in lieu of thesis, with permission of the academic unit's Graduate Faculty.

Master of Latin

The Classics Department offers the non-thesis Master of Latin (M.L.) degree, a 30-credit program mainly for currently employed and/or certified teaching professionals who wish to widen their knowledge of Latin, broaden their education in the field of Classics, and enhance their professional qualifications. This degree can be attained by students in residence for fall/spring terms or by a program of summer course work at UF and by directed independent study and/or distance learning courses during the regular academic year.

Students registering during summer terms can complete the degree in 4 years by earning 6 graduate credits each summer (total = 24), plus two 3-credit independent study or distance learning courses during the intervening academic years. Those who already have some graduate credit in Latin, or who can take more credits during the year, can complete the degree more quickly.

Unlike the M.A. degree in Latin, the Master of Latin degree has no thesis requirement, does not prepare students for Ph.D. level studies, and is aimed specifically at currently employed and certified Latin teachers.

Admission: Contact the Department's Graduate Coordinator or Distance Learning Coordinator before applying. Requirements for the admissions process are:

— Apply to UF's Graduate School,

— Acceptable GRE scores,

— Three letters of recommendation, and

— Transcripts recording undergraduate courses (and graduate courses, if any; students must demonstrate the ability to take Latin courses at the graduate level).

Degree requirements include at least 30 credits as a UF graduate student. Of these, no more than 8 credits (grade of A, A-, B+, or B) may be transferred from institutions approved for this purpose by the Dean of the Graduate School. At least half of the 30 credits required should be from Latin language and literature courses (LAT or LNW courses at the 5000 level or above). UF graduate-level courses taken

before admission to Graduate School (e.g., in the Latin Summer Institutes) may be applied to the 30 credits if approved by the Graduate School. The Department will work closely with individual students to determine how many previous graduate credits at UF or other institutions may be applied to this program.

The student may elect minor work in other academic units (e.g., history, philosophy, art history, religion) although there is no requirement to do so. If a minor is chosen, at least 6 credits are required in the minor field. Two 6-credit minors may be taken with departmental permission. A GPA of 3.0 is required for minor credit and for all work counted toward the degree. All work in a minor must be approved by the supervisory committee.

Examination: The supervisory committee administers a final oral and written comprehensive examination at completion of the course work. This examination includes (1) an oral component on Roman literary tradition and (2) a written component covering (a) Latin sight translation and grammar, (b) Roman history and civilization, and if applicable (c) the minor, or minors. As preparation for this examination, the student should read the required reading list of secondary works in English.

Language requirement: The Department for this degree plan does not require, but strongly recommends, at least a reading knowledge of one (or more) of the following: German, French, Italian, or Spanish. Such study will facilitate reading important secondary works not translated into English, enhance travel, and perhaps lead to teaching opportunities in the chosen language at the secondary school level.

Master of Laws in Comparative Law

The Master of Laws in Comparative Law (LL.M.Comp.Law) degree is for graduates of foreign law schools who want to enhance their understanding of the American legal system and the English common law system. The program starts with Introduction to American Law, a 4-credit summer course that gives students a foundation in the American legal process. It also helps students acclimate to the College of Law and the University community before starting the academic year. During fall and spring terms, and with the director's approval, students choose their remaining 22 credits from more than 100 Juris Doctor and LL.M. in Taxation courses and seminars. For admission information consult the College of Law Catalog or write to the Comparative Law Office, P.O. Box 117643, University of Florida, Gainesville FL 32611-7643.

Master of Laws in Environmental and Land Use Law

The Master of Laws in Environmental and Land Use Law degree is a one-year post-J.D. degree providing an opportunity for experienced attorneys, as well as recent law school graduates, to spend an academic year full-time on the UF campus developing in-depth expertise in environmental and land use law.

For more information about the Environmental and Land Use Law Program, contact
University of Florida Levin College of Law, Environmental and Land Use Law Office
P.O. Box 117625
University of Florida
Gainesville, FL 32611-7625

Phone (352-273-0777) or
E -mail to elulp@law.ufl.edu.

Master of Laws in International Taxation

The Master of Laws in International Taxation (LL.M.I.T.) degree program offers advanced instruction for law graduates who plan to specialize in international taxation, in the practice of law. Degree candidates must complete 26 credits. Of these 26 credits, 22 must be graduate-level tax courses, and 13 must be graduate-level international tax courses, including a research and writing course.

Master of Laws in Taxation

The Master of Laws in Taxation (LL.M.T.) degree program offers advanced instruction for law graduates who plan to specialize in federal taxation and particularly federal income taxation, in the practice of law. Degree candidates must complete 26 credits. Of these 26 credits, 22 must be graduate-level tax courses, including a research and writing course.

Master of Music

The Master of Music (M.M.) degree is offered in music or music education. The music program offers the following concentrations: choral conducting, composition, instrumental conducting, music history and literature, ethnomusicology, music theory, performance, and sacred music. The M.M. degree prepares students for careers as teachers in studios, schools, and universities; performers; music historians; music critics; church musicians; composers; conductors; and accompanists.

Admission: Applicants should have a baccalaureate degree in music or a closely related area from an accredited institution and must meet the admission requirements of the Graduate School and the College of Fine Arts. Students whose undergraduate degree is in another discipline must demonstrate a level of achievement fully acceptable for master's level work in this discipline. Applicants normally complete at least 16 credits in music theory, 6 credits in music history, and 12 credits in performance. A candidate deficient in certain undergraduate areas must remove the deficiencies by successfully completing appropriate courses. If remedial work is needed, the residency (usually 4 terms of full-time study) may be longer. An audition is required for all students.

Work required includes at least 32 credits of course work (not counting prerequisite or deficiency courses) incorporating a core of 9 credits. The core in all emphases includes MUS 6716 (MUE 6785 in the music education program), MUT 6629, and one MUH or MUL graduate course. A thesis or creative project in lieu of thesis is required.

The College of Fine Arts reserves the right to retain student work for purposes of record, exhibition, or instruction. For more information, see *Fields of Instruction*.

Master of Occupational Therapy

The non-thesis Master of Occupational Therapy (M.O.T.) degree program is for students who do not have a degree in occupational therapy, and who want to enter the field of occupational therapy. The program gives students a holistic perspective including an understanding of the philosophical and theoretical bases for practice in

the current health care environment. The M.O.T. program provides a strong background in theory, assessment, and therapeutic intervention.

This 5-term program of graduate study consists of 3 terms of classroom course work and 2 terms (24 weeks) of internship. Students enter the program after completing a bachelor's degree. The M.O.T. degree is awarded after completing 58 credits. Students must receive at least a B (3.00 truncated) on all course work and satisfactory evaluations on all clinical fieldwork.

Master of Public Health

The Master of Public Health (M.P.H.) is a non-thesis degree program that prepares students to become effective public health practitioners, scientists, and educators. Graduates can contribute to the health of the local, national, and international communities through advancing public health knowledge and by designing, implementing, and evaluating programs and policies that prevent disease and promote health. Students have the opportunity to develop skills in 1 of 6 public health concentration areas:

— Biostatistics: Applying quantitative and analytical methods in public health research and evaluation

— Environmental health: Assessing risk levels and protecting the public from environmental threats to health

— Epidemiology: Studying the distribution and determinants of health In populations and communities

— Public health management and policy: Providing leadership in public health administration and developing policies to promote the public's health

— Public health practice: Developing breadth in the field of public health by studying 2 or more of the other concentration areas

— Social and behavioral sciences: Exploring the unique issues faced by diverse groups and populations and acquiring skills to achieve social and behavioral change.

The M.P.H. degree program is a 48-credit program for individuals with bachelor's degrees. Those with prior terminal degrees in health-related fields may take the M.P.H. in an accelerated 42-credit format. Several collaborative programs with professional and graduate degrees are available, including D.V.M./M.P.H., J.D./M.P.H., and Pharm.D./M.P.H. A combined degree program for seniors and a 15-credit certificate program also are offered. For additional information, visit http://www.mph.ufl.edu.

Admission: Applicants with any undergraduate major are considered for the program as long as they meet the Graduate School admission requirements and their interests match the program's philosophy and curriculum.

Work required: In the 48-credit program, students take 16 credits of core public health course work and 5-8 credits of internship. Internships are designed to promote competency in the concentration area and contribute to the student's career goals. The remaining 24-27 credits include required and elective course work in the

concentration area chosen by the student. Specific course requirements vary by concentration area.

Students who have a relevant terminal degree in a health-related field may be eligible for the 42-credit accelerated program, pending M.P.H. admissions committee approval. This program requires completion of 16 credits of core public health course work, 21 credits of concentration course work, and a 5-credit internship.

Master of Science in Architectural Studies

Admission: The Master of Science in Architectural Studies (M.S.A.S.) is a nonprofessional, research degree for students with undergraduate degrees in any field of study who wish to undertake advanced studies and research in architectural specialties. Specialization is offered in environmental technology, architectural preservation, urban design, history, and theory.

Work required includes at least 35 credits of course work incorporating up to 6 credits of ARC 6971 (Research for Master's Thesis). Most course work should be in the School of Architecture, but multidisciplinary electives in planning, history, law, engineering, art history, and real estate are encouraged. Students also may enroll in one of the School's off-campus programs in Nantucket, in the Caribbean, in Hong Kong, or in Vicenza. A thesis is required.

Requirements for level and distribution of credits, supervisory committee, and final examination are the same as for the Master of Arts and Master of Science with thesis.

Master of Science in Nursing

The College of Nursing offers the Master of Science in Nursing (M.S.Nsg.) degree (thesis or non-thesis) with advanced practice preparation for the roles of the nurse practitioner in acute care, adult, family, neonatal, pediatric, psychiatric/mental health, and midwifery nursing. In addition to the advanced practice clinical tracks, the College also offers tracks in public health, adult health clinical nurse specialist, and the clinical nurse leader (CNL). The CNL is a generalist clinician who brings a high level of clinical competence and knowledge to the point of care and serves as a resource for the health care team.

Program requirements include at least 46 credits for advanced practice clinical tracks, and at least 36 credits for the generalist CNL track. Thesis M.S.Nsg. candidates must prepare and present theses acceptable to their supervisory committees and the Graduate School. An oral presentation of the thesis and a comprehensive exam in the major are also required. M.S.N. candidates must pass a comprehensive written examination in the major.

Cooperative M.S.Nsg. degree with Florida State University (FSU) and the University of Florida (UF): For students in the nurse-midwifery clinical track, the cooperative degree program is an approved mechanism allowing students to transfer more than the usual number of semester credit hours (9 vs. 24) from FSU to UF. On completing the curriculum, students are awarded an M.S.Nsg. from UF. Students meet admissions requirements for both universities and take most of the core graduate and primary care courses at FSU; on completing these courses, credits are

transferred to UF and students enroll in the UF midwifery clinical track courses. The guidebook for midwifery students explains admissions, advisement, and progression for traditional and cooperative degree students (http://www.nursing.ufl.edu/prospective/curriculum_plans/midwifery%20guidelines.pdf).

Admission: Applicants for all M.S.Nsg. clinical tracks are encouraged to apply by March 15. After March 15, applications are accepted through May 31, and students are accepted on a space-available basis. For admission criteria and information on the application process, see the Master of Science in Nursing page (http://www.nursing.ufl.edu/prospective/prospective_msn.shtml). For general M.S.N. program inquiries, contact Academic Support Services. For specific information on clinical midwifery, contact Dr. Alice Poe, Clinical Coordinator, Nurse Midwifery Track, (904) 244-5174.

Master of Statistics

The Master of Statistics (M.Stat.) degree requires at least 36 credits including at least 30 graduate credits in the major. Courses are selected in consultation with the supervisory committee chair and approved by the supervisory committee. Students must pass two examinations: (1) a first-year examination, given by a committee designated for the purpose, on material covered in statistics courses for first-year graduate students and (2) a final oral examination consisting of a presentation by the student on a statistical topic not covered in depth in the regular course work. The student should consult with his/her adviser to choose a topic, and present a written report on that topic to the supervisory committee at least 1 week before the examination date. A typical report is 8 to 10 pages. During and after the presentation, the student's committee may ask questions related to the topic of the presentation and related to other material covered in the student's program of study.

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Requirements for Doctoral Degrees

Doctor of Philosophy

The Doctor of Philosophy (Ph.D.) is a research degree and is granted on evidence of general proficiency, distinctive attainment in a special field, and particularly on ability for independent investigation as demonstrated in a dissertation presenting original research with a high degree of literary skill. Consequently, doctoral programs are more flexible and varied than those leading to other graduate degrees. The Graduate Council does not specify what courses are required for the Doctor of Philosophy degree. General requirements: The program should be unified in relation to a clear objective, the program should have the considered approval of the student's entire supervisory committee, and the program should include an appropriate number of credits of doctoral research.

Course Requirements

Course requirements for doctoral degrees vary from field to field and from student to student. In all fields, the Ph.D. degree requires at least 90 credits beyond the bachelor's degree. All master's degrees counted in the minimum must be earned in

the last 7 years.

Transfer of credit: No more than 30 credits of a master's degree from another institution will be transferred to a doctoral program. If a student holds a master's degree in a discipline different from the doctoral program, the master's work will not be counted in the program unless the academic unit petitions the Dean of the Graduate School. All courses beyond the master's degree taken at another university to be applied to the Ph.D. degree must be taken at an institution offering the doctoral degree and must be approved for graduate credit by the Graduate School of the University of Florida. All courses to be transferred must be graduate-level, letter-graded with a grade of B or better and must be demonstrated to relate directly to the degree being sought. All such transfer requests must be made by petition of the supervisory committee no later than the third term of Ph.D. study. The total number of credits (including 30 for a prior master's degree) that may be transferred cannot exceed 45, and in all cases the student must complete the qualifying examination at the University of Florida. In addition, any prior graduate credits earned at UF (e.g., a master's degree in the same or a different discipline) may be transferred into the doctoral program at the discretion of the supervisory committee and by petition to the Graduate School. The petition must show how the prior course work is relevant to the current degree.

Major: A Ph.D. student does the major work in an academic unit specifically approved for offering doctoral courses and supervising dissertations. See Graduate Programs. At least a B (3.00 truncated) is needed for courses included in the major.

Minor: With the supervisory committee's approval, the student may choose one or more minor fields. Minor work may be completed in any academic unit outside the major if approved for master's or doctoral programs listed in this catalog. The collective grade for courses included in a minor must be B (3.00 truncated) or higher.

If one minor is chosen, the supervisory committee member representing the minor suggests 12 to 24 credits of courses numbered 5000 or higher as preparation for a qualifying examination. Part of this credit may have been earned in the master's program. If two minors are chosen, each must include at least 8 credits. Competence in the minor is demonstrated by written examination by the minor academic unit, or by the oral qualifying examination.

Minor course work at the doctoral level may include courses in more than one academic unit if the objective of the minor is clearly stated and the combination of courses is approved by the Graduate School (this approval is not required for a minor in one academic unit).

Leave of Absence

A doctoral student who ceases to be registered at UF for more than 1 term needs prior written approval from the supervisory committee chair for a leave of absence for a stated period of time. This approved leave is kept on file in the student's departmental record. It does not need Graduate School approval. The student must reapply for admission on returning. See *Readmission* and *Catalog Year*.

Supervisory Committee

Supervisory committees are nominated by the academic unit chair, approved by the

dean of the college concerned, and appointed by the Dean of the Graduate School. The committee should be appointed as soon as possible after the student starts doctoral work and no later than the end of the second term of equivalent full-time study. The Dean of the Graduate School is an ex-officio member of all supervisory committees.

Duties and responsibilities of the supervisory committee:

— Inform the student of all regulations governing the degree sought. This does not absolve the student from responsibility for being informed about these regulations. See *General Regulations*.

— Meet immediately after appointment to review the student's qualifications and discuss and approve a program of study.

— Meet to discuss and approve the proposed dissertation project and the plans for carrying it out.

— Give the student a yearly evaluation letter in addition to S/U grades earned for research courses 7979 and 7980. The chair writes this letter after consulting with the supervisory committee.

— Conduct the qualifying examination (or participate in it, if administered by the academic unit).

— Meet when at least half the work on the dissertation is complete, to review procedure, progress, and expected results; and to make suggestions for completion.

— Meet with the student when the dissertation is completed and conduct the final oral examination to assure that the dissertation is a piece of original research and a contribution to knowledge. The supervisory committee chair or cochair must be present with the candidate for the examination. All other committee members may attend remotely. Only the actual supervisory committee may sign the ETD Signature Page, and they must approve the dissertation unanimously. See *Examinations* in *General Regulations*.

Membership: The supervisory committee for a doctoral candidate comprises at least four members selected from the Graduate Faculty. At least two members, including the chair, must be from the academic unit recommending the degree. At least one member serves as external member and should be from a different educational discipline, with no ties to the home academic unit. One regular member may be from the home academic unit or another unit.

If a minor is chosen, the supervisory committee includes at least one Graduate Faculty member representing the student's minor. If the student elects more than one minor, each minor area must be represented on the supervisory committee. Therefore, committees for students with two minors must have a minimum of five members.

Special appointments: People without Graduate Faculty status may be made official members of a student's supervisory committee through the special appointment process. Appropriate candidates for special appointments include

— Individuals from outside UF with specific expertise who contribute to a graduate student's program of study

— Tenure-track faculty not yet qualified for Graduate Faculty status

— Nontenure-track faculty or staff at UF who do not qualify for Graduate Faculty status

Limitations for special appointments:

— They do not hold Graduate Faculty appointments

— They have a special appointment that is specific only to an individual student's committee

— **They may not serve as a supervisory committee chair, cochair, external member, or minor representative.**

The student's supervisory committee chair requests the special appointment, briefly explaining what the special appointment contributes to the supervisory committee. A special appointment is made for a specific supervisory committee. If a student changes to a new degree or major and the committee chair wishes to include the special member on the new supervisory committee, another request must be submitted to the Graduate School for the new committee.

External member:

— Represents the interests of the Graduate School and UF

— Knows Graduate Council policies

— Serves as an advocate for the student at doctoral committee activities.

If the academic unit's committee activity conflicts with broader University policies or practices, the external member is responsible for bringing such conflicts to the attention of the appropriate governing body. Therefore, the external member is prohibited from holding any official interest in the doctoral candidate's major academic unit. Faculty holding joint, affiliate, courtesy, or adjunct appointments in the degree-granting academic unit cannot be external members on a student's committee.

Minor member: The Graduate Faculty member who represents a minor on a student's committee may be appointed as the external member if he/she does not have a courtesy graduate appointment in the student's major academic unit.

Cochair: To substitute for the chair of the committee at any examinations, the cochair must be in the same academic unit as the candidate.

Retired faculty: Graduate Faculty members who retire may continue their service on supervisory committees for 1 year. With approval of the academic unit, retired faculty may continue serving on existing or new committees beyond this period.

Substituting members at qualifying and final examination: If a supervisory committee member cannot be present at the student's final defense, a Graduate

Faculty member in the same academic area may substitute for the absent committee member. The substitute should sign the Final Examination form on the left side, in the space provided for committee members, noting the name of the absent member.

The chair of the student's major academic unit also must indicate the reason for the absence and state that the absent member agreed to this substitution at the final examination.

The substitute should not sign the ETD signature page. The original committee member must sign.

The student and chair or cochair should be present for the oral defense; however, other committee members may elect to attend remotely, with approval by the other committee members, using modern communication technology to be present rather than being physically present at the defense.

No substitutes are allowed for the chair or external member of the committee. Changes to the supervisory committee may be entered online in GIMS before the qualifying examination.

The Graduate Council wants each supervisory committee to function as a University committee (not a departmental committee), applying University-wide standards to the various doctoral degrees. For complete information on the appointment process, consult the Graduate Council Policy Manual, http://gradschool.ufl.edu/archived-files/policy-manual-archived-copy.html (Chapter VIII).

Language Requirement

Any foreign language requirement for the Ph.D. is established by the major academic unit with approval of the college. The student should check with the graduate coordinator of the appropriate academic unit for specific information. The foreign language departments offer classes for graduate students starting to study a language. See the current *Schedule of Courses* for available languages. All candidates must be able to use the English language correctly and effectively, as judged by the supervisory committee.

Campus Residence Requirement

Beyond the first 30 credits counted toward the doctoral degree, students must complete 30 credits enrolled at the University of Florida campus or at an approved branch station of the University of Florida Agricultural Experiment Stations or the Graduate Engineering and Research Center. An academic unit or college may establish and monitor its own more-stringent requirement as desired.

Qualifying Examination

All Ph.D. candidates must take the qualifying examination. It may be taken during the third term of graduate study beyond the bachelor's degree.

The student must be registered in the term the qualifying examination is given.

The examination, prepared and evaluated by the full supervisory committee or the major and minor academic units, is both written and oral and covers the major and minor subjects. Except for allowed substitutions, all members of the supervisory

committee must attend the oral part. Using modern technological means, however, will allow them to attend remotely, should that be necessary. At this time the supervisory committee is responsible for deciding whether the student is qualified to continue work toward a Ph.D. degree.

If a student fails the qualifying examination, the Graduate School should be notified. A re-examination may be requested, but it must be recommended by the supervisory committee. At least one term of additional preparation is needed before re-examination.

Time lapse: Between the oral part of the qualifying examination and the date of the degree there must be at least 2 terms. The term the qualifying examination is passed is counted, if the examination occurs before the midpoint of the term.

Registration in Research Courses

Advanced Research (7979) is open to doctoral students not yet admitted to candidacy (classified as 7 and 8). Students enrolled in 7979 during the term they qualify for candidacy will stay in this registration unless the academic unit elects to change their enrollment to Research for Doctoral Dissertation (7980), which is reserved for doctoral students admitted to candidacy (classified as 9).

Admission to Candidacy

A graduate student becomes a candidate for the Ph.D. degree when the student is granted formal admission to candidacy. Such admission requires the approval of the student's supervisory committee, the academic unit chair, the college dean, and the Dean of the Graduate School. The approval must be based on

— The academic record of the student

— The supervisory committee's opinion on overall fitness for candidacy

— An approved dissertation topic

— A qualifying examination as described above

The student should apply for admission to candidacy as soon as the qualifying examination is passed and a dissertation topic is approved by the student's supervisory committee.

Dissertation

Each doctoral candidate must prepare and present a dissertation that shows independent investigation and that is acceptable in form and content to the supervisory committee and to the Graduate School. The work must be of publishable quality and must be in a form suitable for publication, using the Graduate School's format requirements. **The student and supervisory committee are responsible for level of quality and scholarship.** Graduate Council requires the Graduate School Editorial Office, as agents of the Dean of the Graduate School, to review theses and dissertations for acceptable format, and to make recommendations as needed.

Doctoral dissertation requirements: When first presented to the Graduate School

Editorial Office, the dissertation should be near-final (not a draft) and completely formatted. Students should be completely familiar with the format requirements and should work with the Application Support Center (352 392-HELP, option 5) to troubleshoot their files before providing their first submission document to the Editorial Office for review (see *Deadlines* section in this catalog).

Format requirements:
http://gradschool.ufl.edu/pdf-files/editorial-format.pdf
Format examples:
http://gradschool.ufl.edu/editorial/format.html#samples
Checklist:
http://gradschool.ufl.edu/pdf-files/checklist-dissertation.pdf
Graduate School Editorial Office:
http://gradschool.ufl.edu/editorial/introduction.html#contacts
Application Support Center:
http://etd.circa.ufl.edu

Gatorlink e-mail requirement: UF requires all students to maintain access to their Gatorlink e-mail.

Dissertation first submission: The Editorial Office e-mails the student, using their Gatorlink e-mail, when the dissertation has been accepted as a successful first submission and again once it has been reviewed. Alternatively, the Editorial Office may e-mail the student and the Committee Chair upon first submission to indicate that the document cannot be accepted by the Editorial Office for review. In this case, it is the student's responsibility to work with the Application Support Center to trouble-shoot the document and to resubmit it immediately to the Editorial Office. Once reviewed, the student is responsible for retrieving the marked dissertation and review comments from the Editorial Office and for resolving any deficits related to the format requirements, whether noted or not. As soon as they have defended, students satisfy their committee's requirements, making any and all needed changes.

Uploading and submitting the final pdf: After changes have been made to the satisfaction of the supervisory committee, the ETD Signature page is submitted via GIMS, and the student may then upload and submit the final pdf of the electronic dissertation, through the Editorial Document Management (EDM) system. The Editorial Office checks to make sure the format is acceptable and that the links work, and, in turn, e-mails the student regarding the status of the ETD (electronic thesis or dissertation). If accepted, no further changes are allowed. If changes are necessitated, those changes must be completed, re-submitted, and accepted by the final clearance deadline in order for the student to complete the Editorial process and achieve final clearance status with the Editorial Office.

Editorial final clearance: Among other requirements (see Checklist above), the final dissertation must be accepted (not just submitted) by 5:00 p.m. of this deadline. Most students complete all requirements well in advance. It is the responsibility of the student to ensure they have achieved Final Clearance status by the Final Clearance Deadline for the term in which they intend to graduate. This can be confirmed via GIMS.

Publication of dissertation: All dissertation students must pay a $65 microfilm fee for traditional publication and microfilming fees through UMI/Proquest, even if they

elect not to send the dissertation to UMI for publication. This charge will appear as a hold on the student record in ISIS, only after making first submission to the Graduate School Editorial Office. All dissertation students also must sign a microfilm agreement form. This form is provided to the student at the defense. This form, which is only signed by the student, is delivered, by the student, to the Graduate School Editorial Office by the Final Clearance Deadline for the intended term of degree award. Students who began their graduate program in Fall 2001 or later must submit their final dissertations electronically (not on paper).

Copyright: The student is automatically the copyright holder, by virtue of having written the dissertation. A copyright page should be included immediately after the title page to indicate this. The Editorial Office does not accept copyright registration requests. Registering copyright is not required and does not benefit most students. Any students who wish to register a copyright can do so themselves (http://www.copyright.gov).

Dissertation language: Dissertations must be written in English, except for students pursuing degrees in Romance or Germanic languages and literatures. Students in these disciplines, with the approval of their supervisory committees, may write in the topic language. A foreign language dissertation should have the Acknowledgments, Abstract, and Biographical Sketch written in English. All page titles before Chapter 1 should also be in English.

Journal articles: Dissertations may include journal articles as chapters, if all copyright considerations are addressed appropriately. In such cases, Chapter 1 should be a general introduction, tying everything together as a unified whole. The last chapter should be general conclusions, again tying everything together into a unified whole. Any chapter representing a journal article needs a footnote at the bottom of the first page of the chapter: “Reprinted with permission from . . . ” giving the source, just as it appears in the list of references. The dissertation should have only 1 abstract and 1 reference list.

Guidelines for Restriction on Release of Dissertations

Research performed at the University can effectively contribute to the education of our students and to the body of knowledge that is our heritage only if the results of the research are published freely and openly. Conflicts can develop when it is in the interests of sponsors of university research to restrict such publication. When such conflicts arise, the University must decide what compromises it is willing to accept, taking into account the relevant circumstances. The AAU guidelines contained herein were adopted by the University of Florida Graduate Council on January 19, 1989.

— Sponsors' recommendations should be considered advisory and not mandatory.

— Maximum delay in publication should not exceed 3 months.

— No additional delays in publication beyond the pre-review. Timely submission of any patent or copyright applications requires effective communication among investigators and sponsors throughout the project.

— Participation in nonclassified sponsored research programs cannot be restricted on the basis of citizenship.

— Agreements involving publication delays must not delay students from final defense of their dissertations.

Final Examination

After submitting the dissertation and completing all other work prescribed for the degree, the candidate is given a final examination, oral or written or both, by the supervisory committee, on campus. The candidate and the chair or cochair must be present at the defense, while all other committee members may elect to attend the defense remotely via modern technological advances. The defense should be no more than 6 months before degree award. All forms should be signed at the defense: the candidate and the supervisory committee chair sign the UF Publishing Agreement Form, while the entire supervisory committee signs the ETD Signature Page and the Final Examination Report. If dissertation changes are requested, the supervisory committee chair or his or her designee may hold the ETD Signature Page until all are satisfied with the dissertation. However, this form must be submitted electronically, via GIMS, by the Final Clearance Deadline for the Graduate School Editorial Office, during the term of intended degree award.

Satisfactory performance on this examination and adherence to all Graduate School regulations outlined above complete the requirements for the degree.

Time limitation: All work for the doctorate must be completed within 5 calendar years after the qualifying examination, or this examination must be repeated.

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Doctor of Audiology

The College Public Health and Health Professions offers a program leading to the degree of Doctor of Audiology. The Au.D. degree is awarded after a 4-year program of graduate study. Foreign languages are not required. The program leading to the Au.D. degree is administered by the Department of Speech, Language and Hearing Sciences, the college, and the Graduate School.

Admission: To be considered for the Au.D. program, students must meet the following minimum requirements:

— A 3.00 junior-senior undergraduate grade point average and a program specific acceptable score on the GRE General Test,

— Evidence of good potential for academic success in at least three letters of recommendation, and

— Evidence of acceptable skills in written expression through a personal statement describing the motivation and skills applicable to graduate study and the profession of audiology.

Course requirements include 125 credits for students entering the program with a bachelor's degree awarded by an accredited institution consisting of at least 70 credits of didactic instruction, 45 credits of applied practicum, and 3 credits of audiology research.

A 70-credit program leading to the Au.D. is offered for applicants holding an earned master's degree in audiology from an accredited institution.

A 45-credit program leading to the Au.D. is offered for applicants holding an earned master's from an accredited institution, certification and/or licensure in audiology, and at least 3 years of full-time experience in audiology.

Supervisory committee: Supervisory committees are nominated by the chair of the Department of Speech, Language and Hearing Sciences, approved by the college dean and the dean of the Graduate School.

The committee should be appointed as soon as possible after the student starts the program and, in general, no later than the end of the second term of equivalent full-time study. The supervisory committee shall consist of no fewer than two members of the audiology Graduate Faculty.

Duties of the supervisory committee include curriculum planning for the student, annual evaluation of the student's progress in the program including administration of the oral and written comprehensive examination in the third year of study, and determining successful completion of the audiology research project.

Comprehensive examination, required for all Au.D. candidates, may be taken during the eighth term of study beyond the bachelor's degree. Both written and oral, this examination is prepared and evaluated by the supervisory committee, which is responsible for determining whether the student is qualified to continue work toward the degree by completing the clinical residency.

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Doctor of Education

The Doctor of Education (Ed.D.) degree offers advanced professional training and academic preparation for the highest levels of educational practice. Programs are available in the School of Teaching and Learning, the School of Special Education, School Psychology, and Early Childhood Studies, and the School of Human Development and Organizational Studies in Education.

A minimum of 90 credits beyond the bachelor's degree (master's degrees included must be in the last 7 years) is required. Course requirements vary with the academic unit and with the student's plan for research and/or professional pursuit. With the approval of the supervisory committee, the student may choose one or more minor fields of study. The Ed.D. requires a qualifying examination and a dissertation.

See Requirements for the Ph.D. for information on transfer of credit, minors, leave of absence, supervisory committee, language requirement, campus residence requirement, qualifying and final examinations, admission to candidacy, dissertation, and certification. These statements apply to both the Ph.D. and Ed.D. degrees.

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Doctor of Nursing Practice

The College of Nursing offers a program leading to the degree of Doctor of Nursing Practice (D.N.P.). The program prepares advanced practice nurses with the knowledge, skills, and abilities needed in today's complex health care environment and produces advanced practice nurses with educational background comparable to health care practitioners in other fields.

Admission: To be considered for the D.N.P. program, students must meet the following minimum requirements:

— A bachelor of science in nursing degree for the BSN/DNP program or a master's degree in nursing for the post master's DNP program
— A GPA of at least 3.0 on a 4.0 scale.
— A score of 500 or higher on each of the verbal and quantitative sections of the Graduate Record Examination (GRE).
— Completion of the GRE analytical section.
— Current licensure (or eligibility) in the state of Florida

Program of study: The D.N.P. program consists of 93 credits that can be completed in 8 semesters of full-time study or 14 semesters of part-time study. Students who already have an M.S.N. degree are able to satisfy the requirements of the D.N.P. curriculum upon completion of 48 credits.

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Doctor of Plant Medicine

The College of Agricultural and Life Sciences offers an interdisciplinary program leading to the degree of Doctor of Plant Medicine (D.P.M.). The D.P.M. degree is awarded after a 3- to 4-year program of graduate study. Foreign languages are not required. The program leading to the D.P. M. degree is administered by the College of Agricultural and Life Sciences and the Graduate School.

Admission: Students must meet the following minimum requirements:

— B.S. or B.A. degree, preferably in biological, agricultural, or health science.

— A 3.00 grade point average in upper-division courses.

— A program specific acceptable score on the GRE General Test.

— Applicants from countries where English is not the native language must also achieve a satisfactory score on one of the following: TOEFL (Test of English as a Foreign Language: computer=213, paper=550, web= 80), IELTS (International English Language Testing System: 6), MELAB (Michigan English Language Assessment Battery: 77) or successful completion of the University of Florida English Language Institute program.

— Evidence of good potential for academic success in at least three letters of recommendation.

— Evidence of acceptable skills in written expression through personal statements briefly describing their backgrounds, reasons, and career goals for studying plant medicine.

Course requirements: Students entering the program with a bachelor's degree must earn 120 credits. This includes at least 90 credits of course work and 30 credits of internship. Students entering the program with a master's degree in a related area may be allowed to transfer up to 30 credits in graduate courses corresponding to those required by the plant medicine program.

Supervisory committee: The supervisory committee is selected by the student, nominated by the Director of the Plant Medicine Program, approved by the Dean of the College of Agricultural and Life Sciences, and appointed by the Dean of the Graduate School. The committee should be appointed as soon as possible after starting the program and before midpoint of the student's third term. Each supervisory committee must consist of three UF Graduate Faculty members: one each from entomology/nematology, plant pathology, and plant/soil science. The duties of the supervisory committee include planning elective courses and internships, helping to complete the program of study form (Form 2), evaluating elective internships, periodically evaluating the student's progress in the program (a minimum of two supervisory committee meetings are required and the student should meet with the committee chair regularly and at the start of each semester), and administering the final oral comprehensive examination.

Comprehensive examination: Both written and oral comprehensive examinations are required of all D.P.M. students. The written examination has three sections: entomology/nematology, plant pathology, and plant/soil science. Faculty from the appropriate disciplines are appointed by the Program Director to develop and grade the final written examination, working in concert with faculty who teach courses required for the D.P.M. degree. The three sections of the written exam may be taken independently during the student's last three semesters in the program at the discretion of the supervisory committee and after completion of all course work and internships. After a student passes all three sections of the final written examination (80% or higher is considered a passing grade), the supervisory committee administers an oral examination that tests the student's ability to diagnose and manage plant health problems. A student who fails to pass a comprehensive examination may retake it within 3 months.

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Specialized Degrees

Engineer

For those engineers who need additional technical depth and diversification in their education beyond the master's degree, the College of Engineering offers the degree of Engineer (Eng.). This degree requires at least 30 credits of graduate work beyond the master's degree. It is not to be considered as a partial requirement toward the Ph.D. degree. The student's objective after the master's degree should be the Ph.D. or the Engineer degree.

Admission to the program: Students must have completed a master's degree in engineering and apply for admission to the Graduate School of the University of Florida. The master's degree is regarded as the foundation for the degree of Engineer. The master's degree must be based on the candidate having a bachelor's

degree in engineering from an ABET-accredited curriculum or having taken sufficient articulation course work to meet the minimum requirements specified by ABET.

Course and residence requirements: Total registration in an approved program must include at least 30 graduate credits beyond the master's degree. This minimum requirement must be earned through the University of Florida. The last 30 credits must be completed within 5 calendar years.

Supervisory committee: Each student admitted to the program needs a supervisory committee with at least 3 members of the Graduate Faculty (2 from the major academic unit, and at least 1 from a supporting academic unit). In addition, every effort should be made to have a representative from industry as an external adviser for the student's program.
This committee should be appointed as soon as possible after the student is admitted to Graduate School and no later than the end of the second term of study.

This committee informs the student of all regulations pertaining to the degree program. The committee is nominated by the academic unit chair, approved by the Dean of the College of Engineering, and appointed by the Dean of the Graduate School.

The Dean of the Graduate School is an ex-officio member of all supervisory committees. If a thesis or report is required, the committee will approve the proposed thesis or report and the plans for carrying it out. The thesis must be submitted to the Graduate School. The committee will also conduct the final examination on campus when the plan of study is completed.

Plan of study: Each plan of study is developed on an individual basis for each student. Thus, there are no specific requirements for the major or minor; each student is considered individually. If the plan of study includes a thesis, the student may register for 6 to 12 credits of 6972 (Research for Engineer's Thesis).

Thesis: The thesis should represent performance at a level above that ordinarily associated with the master's degree. It should clearly be an original contribution; this may take the form of scientific research, a design project, or an industrial project approved by the supervisory committee. Work on the thesis may be conducted in an industrial or governmental laboratory under conditions stipulated by the supervisory committee.

Final examination: After the student completes all work on the plan of study, the supervisory committee conducts a final comprehensive oral and/or written examination (for thesis students, this also involves defending the thesis).

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Specialist in Education

An Ed.S. program develops competencies needed for a professional specialization. Specializations are offered in the School of Teaching and Learning, the School of Special Education, School Psychology, and Early Childhood Studies, and the School of Human Development and Organizational Studies in Education Ed.S. applicants must apply and be admitted to UF's Graduate School. All work for the degree, including transferred credit, must be completed within 7 years before the degree is awarded.

The Ed.S. degree is awarded on completing a planned program with at least 72 credits beyond the bachelor's degree or at least 36 credits beyond the master's degree. All credits accepted for the program must contribute to the unity and the stated objective of the total program.

Students are tested (no more than 6 months before graduation) by written and oral examination. A thesis is not required; however, each program includes a research component relevant to the intended profession. With the academic unit's approval, course work taken as part of the specialist program may count toward a doctoral degree.

Students who enter the program with an appropriate master's degree from another accredited institution must complete at least 36 credits of post-master's study to meet the following requirements:

— At least 36 credits in graduate-level courses
— At least 12 credits in graduate-level professional education courses

Students who enter the program with a bachelor's degree only must (during the 72-credit program) meet these requirements in addition to the requirements of the Master of Education degree or its equivalent.

Only graduate-level (5000-7999) work, earned with a grade of B or better, is eligible for transfer of credit. A maximum of 15 transfer credits are allowed. These can include no more than 9 credits from institution/s approved by UF, with the balance obtained from postbaccalaureate work at UF. Credits transferred from other universities are applied toward meeting the degree requirements, but the grades earned are not computed in the student's grade point average. Acceptance of transfer of credit requires approval of the student's supervisory committee and the Dean of the Graduate School.

Petitions for transfer of credit for the Ed.S. degree must be made during the student's first term of enrollment in the Graduate School. The supervisory committee is responsible for basing acceptance of graduate transfer credits on established criteria for ensuring the academic integrity of course work.

Students are tested (no more than 6 months before graduation) by written and oral examination. A thesis is not required; however, each program includes a research component relevant to the intended profession. With the academic unit's approval, course work taken as part of the specialist program may count toward a doctoral degree.

Students who enter the program with an appropriate master's degree from another accredited institution must complete at least 36 credits of post-master's study to meet the following requirements:

— At least 36 credits in graduate-level courses

— At least 12 credits in graduate-level professional education courses

Students who enter the program with a bachelor's degree only must (during the 72-

credit program) meet these requirements in addition to the requirements of the Master of Education degree or its equivalent.

Only graduate-level (5000-7999) work, earned with a grade of B or better, is eligible for transfer of credit. A maximum of 15 transfer credits are allowed. These can include no more than 9 credits from institution/s approved by UF, with the balance obtained from postbaccalaureate work at UF. Credits transferred from other universities are applied toward meeting the degree requirements, but the grades earned are not computed in the student's grade point average. Acceptance of transfer of credit requires approval of the student's supervisory committee and the Dean of the Graduate School.

Petitions for transfer of credit for the Ed.S. degree must be made during the student's first term of enrollment in the Graduate School. The supervisory committee is responsible for basing acceptance of graduate transfer credits on established criteria for ensuring the academic integrity of course work.

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Nontraditional Programs

Concurrent Graduate Programs

Any student interested in pursuing two master's degrees in two different programs or two master's degrees in the same program concurrently should discuss the proposed study with Graduate Student Records (392-4643, 106 Grinter) before applying. Written approval is needed from each academic unit and the Graduate School Dean. The student must be officially admitted to both programs through regular procedures. No more than 9 credits from the first program may be applied toward the second. Contact the academic unit(s) for details.

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Joint Degree Programs

A joint degree program leads to a graduate degree and a professional degree. Normally 12 credits of professional courses count toward the graduate degree and 12 credits of graduate courses count toward the professional degree. Individual academic units determine whether a joint degree program is appropriate. Joint programs established before January 1, 2003, may have other requirements.

To participate in a joint program, a student must be admitted to both programs. Enrollment in one program may precede enrollment in the other according to timelines set by the program. During the term the student is graduating, registration is required (at least 3 credits fall or spring, or 2 credits summer). This course work must be credit that applies toward the graduate degree requirements. See graduate coordinator for details.

Combined Bachelor's/Master's Degree Programs

UF offers a number of bachelor's/master's programs for superior students. In these programs, 12 credits of graduate-level courses are counted for both degrees. See Transfer of Credit for requirements. For admission requirements and available

programs, contact the academic unit.

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State University System Programs

Traveling Scholar program: By mutual agreement of the appropriate academic authorities in both the home and host institutions, traveling scholars' admission requirements are waived and their earned credits are guaranteed acceptance. Traveling scholars are normally limited to 1 term on the host campus, and it cannot be their final term. The program offers special resources on another campus that are not available on the student's home campus. To participate, graduate students need prior approval from their graduate coordinator, their supervisory committee chair, and the Dean of the Graduate School. Interested students should contact Graduate Student Records, 160 Grinter Hall.

Cooperative degree programs: In certain degree programs, faculty from other universities in the State University System hold Graduate Faculty status at UF. In those approved areas, the intellectual resources of these Graduate Faculty members are available to students at UF.

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Interdisciplinary Graduate Certificates and Concentrations

A number of graduate programs offer interdisciplinary enhancements in the form of concentrations, field research, or graduate certificates. Those approved by the Graduate Council are summarized on the next pages.

African Studies

The Center for African Studies, a National Resource Center on Africa (funded partly by Title VI of the Higher Education Act), directs and coordinates interdisciplinary instruction, research, and outreach related to Africa. In cooperation with participating academic units throughout the University, the Center offers a Certificate in African Studies for master's and doctoral students. The curriculum provides a broad foundation for students preparing for teaching or other professional careers requiring knowledge of Africa.

Graduate fellowships and assistantships: Students pursuing degrees in participating academic units can compete for graduate assistantships and Title VI Foreign Language and Area Studies fellowships. Extracurricular activities: The Center for African Studies sponsors the annual *Carter Lectures on Africa* on a given theme, a weekly colloquium series (BARAZA) with invited speakers, an African film series, and periodic brown bag discussions. Other conferences and lectures, and performances and art exhibits in conjunction with other campus units, are held throughout the academic year. The Center also directs an extensive outreach program addressed to public schools, community colleges, and universities nationwide.

Library resources: The Center for African Studies gives direct support for African library acquisitions to meet the instructional and research needs of its faculty and students. The Africana Collection exceeds 120,000 volumes and 500 periodicals. The

Map Library has 360,000 maps and 165,000 serial photographs and satellite images and is among the top five academic African map libraries in the U.S.

Graduate certificate program: The Center for African Studies, cooperating with participating academic units, offers a Certificate in African Studies in conjunction with the master's and doctoral degrees.

For more information about the various programs and activities of the Center, contact the Director, Center for African Studies, 427 Grinter Hall, website http://www.africa.ufl.edu.

Agroforestry

The agroforestry interdisciplinary concentration is administered through the School of Forest Resources and Conservation. It offers facilities for interdisciplinary graduate education (M.S., Ph.D.) by combining course work and research around a thematic field focusing on agroforestry, especially in the context of tropical land use. Students seeking admission to the concentration need a degree in a relevant field such as agronomy, forestry, horticulture, soil science, or social sciences. They should apply to the School of Forest Resources and Conservation or another academic unit that closely represents their background and interest. Course work may be chosen from several related disciplines. Thesis research can be undertaken in Florida or overseas. Degrees are awarded through the academic units the candidates are enrolled in.

In conjunction with the graduate degree, a student can earn a concentration or minor in agroforestry by fulfilling certain requirements. Students who have a primary interest in agroforestry and undertake graduate research on an agroforestry topic can seek the concentration. Those who have an active interest and some training in agroforestry, but do not conduct graduate research on an agroforestry topic, can earn a minor. Candidates meeting the requirements can have Concentration in Agroforestry or Minor in Agroforestry appear on their transcripts.

Each option requires completing FNR 5335 (Agroforestry) and an appropriate number of approved supporting courses. These courses should be distributed over at least two academic units outside the major to prepare the student to function in multidisciplinary teams and to associate with professionals from other disciplines. Students whose background is in biology are encouraged to take social science courses, and vice versa.

For a student with a concentration or minor in agroforestry, at least one member of the supervisory committee should represent agroforestry. The Agroforestry Program Advisory Committee requires this member to counsel the student on selecting courses and the research topic.

For more information, contact the Agroforestry Program Leader, 330 Newins-Ziegler Hall, Phone (352) 846-0880, Fax (352) 846-1277, E-mail pknair@ufl.edu.

Animal Molecular and Cell Biology

The interdisciplinary concentration in animal molecular and cell biology (AMCB) gives graduate students in the animal and veterinary sciences an understanding of principles of molecular and cell biology as applied to animal health and production. It emphasizes participation in molecular and cell biology research and provides an

intellectual environment for cross-fertilization among disciplines. Graduate Faculty from the Departments of Animal Sciences, Biochemistry and Molecular Biology, Chemistry, and the College of Veterinary Medicine participate in the program. The AMCB gives graduate students access to the diverse research facilities needed to study cellular and molecular biology, reproductive biology, virology, immunology, and endocrinology. Facilities exist for recombinant DNA research, experimental surgery, in vitro culture of cells, tissue and organ explants, embryo manipulation, vaccine production, and recombinant protein engineering.

Ph.D. degrees are awarded by participating academic units, with an interdisciplinary concentration in animal molecular and cell biology. Applicants need a strong background in animal or veterinary sciences. Graduate degree programs are designed by each student's supervisory committee, headed by the member who represents AMCB. All students must complete a core curriculum, may obtain cross-disciplinary training through rotations in laboratories of participating faculty, and may participate in the AMCB seminar series.

Requirements for admission to AMCB are the same as for the faculty adviser's academic unit and college. Graduate assistantships and fellowships are available from sources in individual academic units and the AMCB. For more information, contact Dr. Peter J. Hansen, Department of Animal Sciences, pjhansen@ufl.edu.

Biological Sciences

The Archie Carr Center for Sea Turtle Research conducts research on all aspects of the biology of sea turtles. Researchers at the Center for Sea Turtle Research, collaborating with students and faculty of various academic units, take a multidisciplinary approach to address the complex problems of sea turtle biology and conservation. Scientists from the Center have investigated questions of sea turtle biology around the world, from the molecular level to the ecosystem level, from studies of population structure based on mitochondrial DNA to the effects of ocean circulation patterns on the movements and distribution of sea turtles. Long-term field studies of the Center are conducted mainly at two research stations in the Bahamas and the Azores. For more information, contact the Director, Archie Carr Center for Sea Turtle Research, 223 Bartram Hall, Phone (352) 392-5194, Website http://accstr.ufl.edu.

The Whitney Laboratory for Marine Bioscience is a UF research center for biomedical research and biotechnology. Founded in 1974, the Whitney Lab is dedicated to using marine model animals for studying fundamental problems in biology and applying that knowledge to issues of human health, natural resources, and the environment.

The academic staff of the Whitney Laboratory consists of 10 tenure-track and 2 nontenure-track faculty members, together with 50 associates, students, and visiting scientists. Dr. Peter A. V. Anderson is the director.

Fields of research conducted at the Whitney Laboratory include chemosensory and visual physiology and biochemistry, neural pattern generators, ion channel structure and function, neurogenomics, synaptogenesis and synaptic physiology, protein-lipid interactions, physiology and evolution of neurotransmitter pathways, membrane pumps and transporters, and regulation of ciliary mechanisms. This research uses the

techniques of modern cell and molecular biology, for which the Laboratory is particularly well equipped and recognized.

Research at Whitney Laboratory attracts graduate students and scientists from all over the United States and abroad. Students enroll in the graduate programs of academic units on campus and complete their course work before moving to the Whitney Laboratory, where they conduct their dissertation research under the supervision of resident faculty. An NSF undergraduate research training program at the Whitney Laboratory is also available for 10-week periods.

The Laboratory is situated on a narrow barrier island with both the Atlantic Ocean and the Intracoastal Waterway within a few hundred feet of the facility. It is located in Marineland, about 18 miles south of St. Augustine and 80 miles from Gainesville.

For more information, contact the Director, Whitney Laboratory for Marine Bioscience, 9505 Ocean Shore Blvd, St. Augustine FL 32080-8610, Phone (904) 461-4000; Fax (904) 461-4008; Website http://www.whitney.ufl.edu.

The UF Marine Laboratory at Seahorse Key is a field station providing (a) support for research by students, faculty, and visiting scientists; (b) an outstanding teaching program in marine related subjects; and (c) support from public education related to marine, estuarine, and coastal resources of Florida. Seahorse Key is 57 miles west of Gainesville on the Gulf Coast, 3 miles offshore and opposite Cedar Key. Facilities include a research vessel, several smaller outboard-powered boats for shallow water and inshore work, a 20 x 40 foot research and teaching building, and a 10-room residence, with 2 kitchens, a dining lounge, and dormitory accommodations for 24 persons.

Chemical Physics

The Center for Chemical Physics, with participating faculty from the Departments of Chemistry, Physics, and Chemical Engineering, is concerned with graduate education and research in the theoretical, experimental, and computational aspects of problems in the borderline between chemistry and physics. Graduate students join one of the above academic units and follow a special curriculum. The student receives a Ph.D. degree and a Certificate in Chemical Physics. For information, contact the Director, Dr. Valeria Kleiman, 311A Chemistry Laboratory Building, P.O. Box 117200, Gainesville FL 32611, E-mail kleiman@chem.ufl.edu.

Ecological Engineering

The Graduate Certificate in Ecological Engineering is for graduate engineering students wishing to develop expertise in ecological solutions to engineering problems. Students interested in the certificate must apply for admission through the Department of Environmental Engineering Sciences. The certificate program is open to individuals in any graduate program who hold an undergraduate engineering degree, or who complete the additional undergraduate engineering articulation courses needed to bring the student's background to the minimum level required for engineers by the Accreditation Board for Engineering and Technology.

The certificate program consists of 15 course credits, and a research project with content materially related to some aspect of ecological engineering. If appropriate,

the 15 credits of graduate course work may count toward the minimum requirements for the graduate degree. The student's terminal project, master's thesis, or individual studies project may satisfy the ecological engineering project requirement. For more information, contact the Graduate Coordinator, Department of Environmental Engineering Sciences, P.O. Box 116450, University of Florida, Gainesville FL 32611, Phone (352) 392-8450.

Geographic Information Systems

Geographic Information Systems (GIS) revolutionized the way land features are located, measured, inventoried, managed, planned, and studied. GIS provides theories and methods for measuring location and topography, physical and biological attributes, and distribution of cultural components through data storage, analysis, modeling, mapping, and data display.

GIS applications are diverse. They include determining the suitability of land for different uses, planning future land uses, setting cadastral boundaries for the purpose of property recognition and taxation and regulation, analyzing land and land-cover for both resource inventories and scientific studies, and siting commercial enterprises.

Users and producers of GIS include engineers, geographers, planners, biologists and ecologists, land resource managers, archaeologists, sociologists, public health professionals, medical researchers, property tax assessors, law enforcement officers, land-development companies, utility companies, and retail stores. Undergraduate and graduate students who learn to use GIS technology are in high demand and so start at higher salaries than their non-GIS peers. As a result the GIS community at the University of Florida developed the **Interdisciplinary Concentration for Geographic Information Systems (ICGIS)**.

The ICGIS integrates existing GIS resources on campus, for graduate students, in response to changing regulatory environments in institutions and governments at all levels. This concentration established a standard set of courses and activities that allow graduate students to become experts in creating, studying, and using geographic information. Such graduates are in strong positions to meet future regulatory requirements for certification as professionals. Structurally, the ICGIS established a five-category curriculum within the standard M.S., M.A., M.E., or Ph.D. requirements. Completing the GIS concentration is officially recognized by statements on transcripts and a certificate.

For more information, contact Dr. Scot E. Smith, University of Florida, P.O. Box 110565, Gainesville FL 32611, Phone (352) 392-4990 , E-mail sesmith@ifas.ufl.edu

Graduate Certificate in Geriatric Care Management

The Geriatric Care Management Graduate Certificate program is designed to meet the

needs of today's working professionals. The program requires the successful completion of four graduate level courses with a grade of B or higher as well as a 50-hour supervised clinical experience to be completed in the area in which the student resides. The courses associated with this program are offered on a semester basis (Spring, Summer and Fall) and each semester is thirteen weeks in length.
All courses are taught utilizing a web based e-learning system. The courses are

organized in weekly modules which include audio power point presentations, video lectures, assigned reading and on-line discussion forums. The material is designed to be completed in self paced / flexible format. Each course utilizes an electronic discussion board that provides an in depth interactive experience while at the same time offering individual flexibility to the working professional student.
The final requirement for the Graduate level certificate is the supervised clinical experience. Depending upon the individual professional background most students are required to complete a supervised clinical experience under the supervision of a professional practicing in the field of geriatric care management. If you are already employed as a professional geriatric care manager you may be able (based on your individual background) to waive this requirement. For further information, please contact UF - GCM Program via an e-mail to gcmsupport@dce.ufl.edu.

Historic Preservation

Historic preservation is the safeguarding of all cultural heritage: tangible and intangible. The College of Design, Construction, and Planning offers an interdisciplinary opportunity to study for the profession through multiple fields including archeology, architecture, landscape architecture, urban and regional planning, interior design, building construction, museum studies, law, and cultural tourism. The master's degree course work is practical and technical in scope and includes the study of history, research techniques, traditional crafts, materials conservation, documentation, interpretation, cultural research management, housing, urban rejuvenation and adaptive use of historic structures, restoration methodologies, economics, green design and sustainable/livable communities.

The 21st century offers significant expansion of the field of heritage conservation to address smart growth, sustainability, and economic development initiatives. Many related jobs exist, including preservation consultant, preservation contractor, preservation researcher, Main Street program director, site manager, lawyer, archeologist, cultural resource manager, historian, real estate professional, and policy administrator.

The College offers several nationally recognized field schools or practica: Preservation Institute: Nantucket, Traditional Crafts Field School, and the National Historic Landmarks District in Saint Augustine, America's oldest city.

The Interdisciplinary Concentration and Certificate in Historic Preservation (ICCHP) integrates resources throughout UF to address the diverse topics relevant to the field. Thus, the ICCHP establishes a set of courses that allow graduate students to gain expertise in researching and applying historic preservation in the United States and abroad. Depending on the student's career goals and background, this can include recognizing, documenting, and protecting historic structures and sites; rehabilitation and restoration technologies; and exploring emerging and related specializations such as community development and sustainable development.

The interdisciplinary curriculum structure draws on course work providing 12 credits for master's students and 15 credits for Ph.D. students specializing in historic preservation. The concentration is officially recognized by statements on the transcript and by a certificate.

For more information, contact Roy Eugene Graham, FAIA, Bienecke-Reeves

Distinguished Professor, Director of Historic Preservation Programs, University of Florida, P.O. Box 115701, Gainesville FL 32611, Phone (352)392-0205, ext. 233, E-mail regraham@ufl.edu.

The University of Florida College of Design, Construction and Planning offers **a Master of Historic Preservation** degree using an interdisciplinary variety of coursework in the basic and applied skills and arts of historic preservation, anthropology, archeology, architecture, building construction, cultural tourism, history, interior design, landscape architecture, museum studies, and urban and regional planning. The coursework totals 42 hours. Students must take 12 hours of core courses, 6 hours of pre-approved history electives, and may choose from pre-approved and specially approved electives from across the campus. A true thesis to meet Graduate Requirements relating to historic preservation is required.

Program of Study

The Master of Historic Preservation degree program promotes interdisciplinary thinking in historic preservation by combining (1) required coursework in history and theory, research, documentation and recording historic sites, conservation of building materials and systems, and practica or other practical experience with (2) two courses in the history of the designed environment (including, for example architecture, urban development, landscape architecture, archeology, or material culture.) with (3) electives from a list of courses identified by the faculty, in the subject areas of resource-related studies including design issues, neighborhood issues (zoning, strategic planning, housing and social aspects of real estate development) historic and cultural landscape issues, historic interior issues, economic issues (marketing principles, private and public finance, property management and budget preparation), legal issues (Constitutional law, preservation case law, federal, state and local regulatory legislation and administration) sustainability issues traditional building crafts and curatorial issues (site development interpretation, management and cultural tourism). A true thesis that meets Graduate Requirements on an approved historic preservation topic is also required.

For more information contact
Kay Williams, FASLA
Graduate Coordinator
352-392-6098 ext. 326

Becky Hudson
Program Assistant
352-392-0205 ext. 202

Hydrologic Sciences

Interdisciplinary graduate studies in hydrologic sciences are for science and engineering students seeking advanced training in diverse aspects of water quantity and quality, and water-use issues. This concentration emphasizes (1) understanding the physical, chemical, and biological processes occurring over broad spatial and temporal scales; and (2) skills in hydrologic policy and management based on a strong background in natural and social sciences and engineering.

Graduate Faculty from nine departments in three colleges contribute to this

interdisciplinary concentration. Depending on academic background and research interests, students may earn a degree in any one of the following departments: Agricultural and Biological Engineering, Civil and Coastal Engineering, Environmental Engineering Sciences, Food and Resource Economics, Forest Resources and Conservation, Geography, Geological Sciences, Horticultural Sciences, and Soil and Water Science.

M.S. (thesis and non-thesis option) and Ph.D. studies are available. Interdisciplinary graduate requirements recognize diversity in the academic backgrounds and professional goals of the students. A core curriculum (12 credits for M.S.; 18 credits for Ph.D.) provides broad training in five topics: hydrologic systems, hydrologic chemistry, hydrologic biology, hydrologic techniques and analysis, and hydrologic policy and management. Additional elective courses (11 to 14 credits for M.S.; 30 credits for Ph.D.) allow specialization in one or more of these topics. Research projects involving faculty from several academic units can provide the basis for thesis and dissertation research topics.

Assistantships supported by extramural grants are available. Tuition waivers may be available to students who qualify. Students with B.S. or M.S. degrees in any of the following disciplines are encouraged to consider this specialization in their graduate program: engineering (agricultural, chemical, civil, environmental); natural sciences (physics, biology, chemistry); social sciences (agricultural and resource economics); forestry; and earth sciences (geography, geology, soil and water science).

For more information, contact Dr. Mark Newman, UF Water Institute, P.O. Box 116601, Gainesville FL 32611, Phone (352) 392-5893, E-mail markn@ufl.edu; or visit the Hydrologic Sciences Academic Cluster website (http://www.hydrology.ufl.edu).

Latin American Studies

Founded in 1930, the UF Center for Latin American Studies is the oldest in the U.S. and remains a premier institution. It offers interdisciplinary teaching and research programs focused on Latin America and the Caribbean. The M.A. program draws on 20 center-based Graduate Faculty and more than 160 faculty affiliates who teach courses or carry out research related to Latin America.

Master of Arts degree in Latin American Studies: This M.A. degree requires a thesis and 30 credits, including a 15 credit specialization in either a discipline or a topic.

Discipline specializations emphasize training and research in area and language studies in a specific academic unit, such as Anthropology, Geography, History, Political Science, Romance Languages and Literatures (Spanish, Portuguese, or Haitian Creole), or Sociology. This option is especially suited to students interested in pursuing a Ph.D. in a related discipline.

Topical specializations cluster course work and research around a thematic field focusing on contemporary Latin American problems, such as Andean studies, Brazilian studies, Caribbean studies, development, gender studies, international communications, Latin American business environment, Latino studies, religion and society, and tropical conservation and development. This option prepares students for technical and professional work related to Latin America and the Caribbean.

Additional requirements for both options are as follows:

— 2 required gateway seminars: LAS 6220, Issues and Perspectives in Latin American Studies and LAS 6293, Design and Methods of Research in Latin American Studies; ideally, both seminars are taken in the first semester;

— 9 credits of Latin American area or language courses outside the specialization; and

— Intermediate proficiency in Spanish, Portuguese, or Haitian Creole; and

— An interdisciplinary thesis on a Latin American topic.

Although the M.A. degree in Latin American studies is a terminal degree, many past recipients have entered the Ph.D. programs in related disciplines preparing for university teaching and research careers. Other graduates are employed in the Foreign Service, educational and research institutions, international organizations, government or nonprofit agencies, and private companies in the United States and Latin America.

Requirements for admission to the program are:

— A baccalaureate degree from an accredited college or university;

— Grade point average of at least 3.2 for all upper-division undergraduate work;

— Acceptable scores on the Graduate Record Examination;

— For international students, a satisfactory score on one of the following: TOEFL (Test of English as a Foreign Language: computer=213, paper=550, web=80), IELTS (International English Language Testing System: 6), MELAB (Michigan English Language Assessment Battery: 77), or successful completion of the UF English Language Institute Program;

— Basic knowledge of either Spanish or Portuguese; some Latin American course work.

Juris Doctor / Master of Arts program: This joint degree culminates in the Juris Doctor degree awarded by the College of Law and the Master of Arts degree in Latin American studies awarded by the College of Liberal Arts and Sciences. The joint degrees can be completed in four years rather than the five years required if earning each degree separately.

Candidates for the joint program must be admitted to both academic units. See *Requirements for Master's Degrees* for admission criteria for the M.A. program. Contact the College of Law for J.D. requirements. For more information, contact Dr. Richmond Brown, Center for Latin American Studies (rfbrown@latam.ufl.edu).

Graduate Certificates in Latin American Studies: Graduate students may earn a Certificate in Latin American Studies along with a degree from the College of Agricultural and Life Sciences; Business Administration; Design, Construction, and Planning; Education; Fine Arts; Journalism and Communications; Law; or Liberal Arts and Sciences.

M.A. thesis or Ph.D. students need at least 12 credits of Latin American course work distributed as follows:

— 3 credits of LAS 6938;

— At least 3 credits of Latin American course work in one academic unit outside the major;

— 6 credits of courses with Latin American content within the major (to the extent possible);

— Intermediate proficiency in a Latin American language (language courses at the 3000 level or higher count toward the certificate); and

— a thesis or dissertation on a Latin American topic.

Non-thesis master's degree candidates must have at least 15 credits of Latin American course work distributed as follows:

— 3 credits of LAS 6938;

— At least 6 credits of Latin American courses in an academic unit or units outside the major;

— 6 credits of courses with Latin American content within the major (to the extent possible); and

— intermediate proficiency in a Latin American language. For more information, see http://www.latam.ufl.edu/academic/programs

Financial support: The Center for Latin American Studies provides several graduate assistantships and academic year and summer FLAS fellowships for Portuguese, Haitian Creole, and/or Garifuna. The Center also provides substantial financial support for UF graduate students pursuing research in Latin America, the Caribbean, and Latino Studies.

Research: Several research and training programs provide opportunities and financial support for graduate students, especially in the Amazon, the Andes, and the Caribbean.

Library resources: The Latin American Collection of the UF libraries holds more than 400,000 volumes of printed works and manuscripts, maps, and microforms and more than 1,000 serial titles dealing with Latin America and the Caribbean. All areas are well-represented but particular strengths are on Brazil and the Caribbean. UF's Caribbean Collection is the largest in the world.

Other activities: The Center for Latin American Studies sponsors conferences, colloquia, and cultural events; supports publication of scholarly works; provides educational outreach service; and cooperates with other campus units in overseas research and training activities. The Center also administers summer programs in Brazil and Mexico.

For more information on the Center's programs and activities, contact the Center's Associate Director for Academic Programs and Student Affairs, Dr. Richmond Brown,

319F Grinter Hall, E-mail rfbrown@latam.ufl.edu, Phone (352) 392-0375, ext 807.

Medical Physics

Medical Physics applies advanced physical energy concepts and methods to the diagnosis and treatment of human disease. Students enroll in the Department of Nuclear and Radiological Engineering and take courses taught by the medical physics faculty from Nuclear and Radiological Engineering, Radiology, and Radiation Oncology. Students interested in the radiation protection aspects of applications of radioactivity or radiation in the healing arts may enroll in the medical health physics option. Formal courses include academic unit core requirements, a radiation biology course, and a block of clinical medical physics courses taught by Nuclear and Radiological Engineering, Radiology, and Radiation Oncology faculty. The program also includes clinical internships in the Departments of Radiology and Radiation Oncology. Research opportunities and financial support exist in the form of faculty research and projects related to patient care.

Modern European Studies

The Center for European Studies, a National Resource Center on Europe (funded partly by Title VI of the Higher Education Act), directs and coordinates interdisciplinary instruction, research, and outreach related to Europe. In cooperation with participating academic units throughout the University, the Center offers a Certificate in Modern European Studies for master's and doctoral students. The curriculum provides a broad foundation for students preparing for teaching or other professional careers requiring knowledge of Europe.

Graduate fellowships and assistantships: Students pursuing degrees in participating academic units can compete for graduate assistantships and Title VI Foreign Language and Area Studies fellowships.

Extracurricular activities: The Center for European Studies sponsors various conferences, lectures, film series, performances, and art exhibits in conjunction with other campus units. The Center also directs an extensive outreach program addressed to public schools, local community, as well as business groups.

Library resources: The Center for European Studies gives direct support for European library acquisitions to meet the instructional and research needs of its faculty and students.

Graduate certificate program: The Center for European Studies, cooperating with participating academic units, offers a Certificate in Modern European Studies in conjunction with the master's and doctoral degrees. To obtain the Certificate, students at the master's level need to complete 13 credit hours and students at the doctoral level need to complete 16 credit hours of courses with European content. Both master's and doctoral students are required to complete a 1-unit EUS 6005: Introduction to European Studies course. Given the critical role of languages to the comprehensive study of Europe all certificate recipients are required to complete at least one year of training at the 2000 level or above in at least one European language. However, in accordance with Graduate School regulations no language courses below the 3000 level will be included within the certificate program itself. Those students with a high level of language training, however, may count up to a

maximum of two language courses at the 3000 level or higher towards the completion of the Certificate in Modern European Studies. In all cases students must complete at least 9 credit hours of course work outside their home department or unit.

For more information about the various programs and activities of the Center, contact the Director, Center for European Studies, 3324 Turlington Hall, Website http://www.ces.ufl.edu.

Quantitative Finance

The interdisciplinary concentration in quantitative finance trains students for academic and research positions in quantitative finance, and risk management. It gives graduates an edge in the job market by providing substantial expertise in key related disciplines: finance, operations research, statistics, mathematics, and software development. It is focused in teaching and research on design, development, and implementing new financial and risk management products, processes, strategies, and systems to meet demands of various institutions, corporations, governments, and households. Emphasis is on an interdisciplinary approach requiring knowledge in finance, economics, mathematics, probability/statistics, operations research, engineering, and computer science.

Four academic units participate in this interdisciplinary concentration: Industrial and Systems Engineering (College of Engineering), Mathematics (College of Liberal Arts and Sciences), Statistics (College of Liberal Arts and Sciences), and Finance, Insurance, and Real Estate (College of Business Administration). To be eligible, a student must be admitted to a Ph.D. program in one of these participating academic units. Students seeking admission to the concentration need strong quantitative skills and a degree in one of the relevant fields such as finance, engineering, statistics, or mathematics. Students with a background in several disciplines are welcome. Application should be submitted to one of the participating academic units.

Each student takes basic courses and meets the home academic unit's Ph.D. requirements. The student also takes approved courses in the other participating academic units to meet the requirements of the concentration.

Dissertation research is conducted in quantitative finance, risk management, and relevant areas involving quantitative finance approaches. The student receives a Ph.D. degree and a Certificate in Quantitative Finance.

Activities of the Ph.D. concentration in quantitative finance are supported by the Risk Management and Financial Engineering Laboratory (RMFE Lab), http://www.ise.ufl.edu/rmfe. The RMFE Lab facilitates research and applications in the area of risk management and financial mathematics/engineering, including organizing research meetings, seminars, and conferences. It provides a basis for the collaborative efforts of multidisciplinary teams of UF researchers, governmental institutions, and industrial partners. For details, visit http://www.ise.ufl.edu/rmfe/qf.

Quantum Theory Project (QTP)

QTP is an interdisciplinary group of 12 faculty plus graduate students, postdoctoral associates, and staff in the Departments of Physics and Chemistry. The

computationally oriented theoretical research investigates electronic structure, conformation, properties, and dynamics of molecules and materials. The work covers large areas of modern chemistry, condensed matter and materials physics, and molecular biology. Essentially all the effort is supported by substantial extramural funding, both individual and collaborative. QTP operates the J. C. Slater Computer Laboratory to support large-scale computing for precise numerical solutions and simulations, plus graphics and visualization. Since 1960, the Institute has organized a major international meeting, the annual Sanibel Symposium.

Graduate students in chemistry and in physics are eligible for this specialization and follow a special curriculum. For more information, contact the Director, Quantum Theory Project, E-mail director@gtp.ufl.edu, P.O. Box 118435 (New Physics Building); or visit the QTP website http://www.qtp.ufl.edu.

Sustainable Architecture

The Concentration and Certificate in Sustainable Architecture is for architecture graduate students (in the M.Arch. or M.S.A.S. program) seeking advanced courses on a wide range of topics related to sustainable architecture. The concentration in sustainable architecture supports detailed rigorous study in specific areas of expertise. Furthermore, the program requirements recognize the inherent diversity of academic backgrounds and professional goals of the students. Thus, there is flexibility in the selection of a suite of courses, while maintaining exposure to the multidisciplinary subject matter of sustainable architecture. This essential feature of the program allows students to develop individualized yet focused plans of study. Students select from a variety of approved courses offered in the College of Design, Construction, and Planning (the School of Architecture, the School of Building Construction, the Department of Interior Design, the Department of Landscape Architecture, and the Department of Urban and Regional Planning); and in other colleges in the University. Course work may include the following sustainability issues.

— **Architectural design and preventing environmental degradation:** protecting ecosystems, fauna and flora, energy consumption, energy conservation, architectural commissioning, maintenance, water consumption, land use, and materials selection (resource depletion, environmental degradation, and healthy environments)

— **Providing healthy architectural environments:** indoor air environmental quality, nontoxic environments, and sustainable ecosystems and landscapes

— **Responsive and responsible building design and construction:** environmentally responsive architecture, and environmentally responsible architecture

— **Sustainable architectural and environment theory:** the philosophy of sustainable design, ecological theory, sustainability and ethics, deep ecology, and systems theory

— **Enhancing the community environment:** historic preservation, sustainable developments, community and neighborhood design, regional design, and systems theory

— **Mitigating the environmental effects of construction operations:** life cycle operations, design longevity, reusing materials, recycling materials, deconstruction, and reconstruction.

Students enrolled in the Concentration and Certificate Program in Sustainable Architecture must complete at least 12 credits of approved sustainable architecture electives. Students must complete at least 6 credits within the School of Architecture; and at least one approved 3 credit course from outside the School of Architecture. Students also must complete a research project or thesis on a subject pre-approved by the concentration's Governing Board, related to sustainable architecture. For more information, contact the Graduate Program Assistant, School of Architecture, University of Florida, Box 115702, Gainesville FL 32611-5702, Phone (352) 392-0205 ext. 202, E-mail bhuds@ufl.edu

Sustainable Design

The Interdisciplinary Concentration and Certificate in Sustainable Design (ICSD) is for master's-level students in the College of Design, Construction, and Planning. This concentration allows students to become proficient in one or more of the following areas: sustainable architecture, sustainable construction, sustainable interior design, sustainable landscape architecture, or sustainable urban planning. Course work deals with the following issues.

— **Preventing environmental degradation:** protecting ecosystems, fauna and flora, energy conservation, energy consumption, architectural commissioning, maintenance, water consumption, land use, site selection, and materials selection (resource depletion, environmental degradation, and healthy environments)

— **Providing healthy environments:** indoor air environmental quality, outdoor environmental quality, nontoxic environments, and sustainable ecosystems and landscapes

— **Responsive and responsible building construction:** construction impacts on sites, environmentally responsive architecture, environmentally responsible architecture (preventing environmental degradation), and designing sustainable building components

— **Mitigating the environmental effects of construction operations:** life cycle operations, design longevity, reusing materials, recycling materials, deconstruction, reconstruction, and historic preservation

— **Enhancing the community environment:** sustainable developments, community and neighborhood design, regional design, and city planning design

— **Environmental theory:** the philosophy of sustainable design, ecological theory, sustainability and ethics, deep ecology, and systems theory.

Students wishing to participate in the ICSD should notify their department or school as early in the graduate program as possible. To participate in the ICSD, a student must be admitted and enrolled in one of the departments participating in the ICSD. Students will complete the concentration for either the master's degree or Master of Science degree, but not for both degrees if awarded from the University of Florida. **Students cannot enroll in two concentration programs at the same time.**

To successfully complete the ICSD, the student must earn 12 credit hours in sustainable design research and course work from a list of recommended courses. To

satisfy the interdisciplinary intent of the ICSD, the student must take one of the approved 3 credit courses outside their home department or school, but within the College of Design, Construction, and Planning; and at least one approved 3 credit course from another college of the University. For more information, contact the Dean's Office in the College of Design, Construction, and Planning, University of Florida, Box 115701, Gainesville FL 32611, Telephone (352) 392-4836.

Toxicology

The Center for Environmental and Human Toxicology serves as the focal point for activities concerning the effects of chemicals on human and animal health. The Center's affiliated faculty includes 20 to 30 scientists and clinicians interested in elucidating the mechanisms of chemical-induced toxicity, and is drawn from the Colleges of Medicine, Veterinary Medicine, Pharmacy, Public Health and Health Professions, Engineering, and the Institute of Food and Agricultural Sciences. The broadly based, interdisciplinary expertise provided by this faculty is also used to address complex issues related to protecting public health and the environment.

Students who wish to receive graduate training in interdisciplinary toxicology leading to a Ph.D. enroll through one of the participating graduate programs. The number of graduate programs involved in interdisciplinary toxicology, and the variety of perspectives provided by their disciplines, allows a great deal of flexibility in providing a plan of graduate study to meet an individual student's interests and goals in toxicology. Student course work and dissertation research are guided by the Center's researchers and affiliated faculty who are also Graduate Faculty members in the student's major academic unit. Dissertation research may be conducted either in the student's academic unit, or at the Toxicology Laboratory facilities, at the Center. For more information, please write to the Director, Center for Environmental and Human Toxicology, P.O. Box 110885, University of Florida, Gainesville, FL 32611; or visit their website (http://toxicology.ufl.edu).

Transnational and Global Studies

The Transnational and Global Studies Center (TGSC) is one of several federally funded centers on campus. The TGSC is a National Resource Center created in 2003 through funding from the U.S. Department of Education. It is part of a Florida-wide consortium of universities, the Florida Network for Global Studies. The TGSC is housed in the International Center but has affiliated faculty from the entire campus. The TGSC promotes interdisciplinary research, supports faculty and students by developing curricula and academic programs, sponsors cultural activities and guest speakers on transnational and global issues, and conducts outreach. The TGSC offers the Transnational and Global Studies Graduate Certificate. This certificate will enable graduate students to identify one of four tracks that will help strengthen their interdisciplinary studies. The graduate tracks articulate with the undergraduate international studies major. The certificate curriculum is reviewed by the Transnational and Global Studies (TNGS) Certificate Committee for approval but does not supersede the supervisory committee's role. The graduate certificate recognizes successful completion of course work (13 credits for master's, 15 credits for Ph.D.) related to transnational and global issues. Courses meeting certificate requirements come from more than 50 graduate courses with specific transnational and global content, organized into four areas of specialization: science and technology, business and economics, global governance and security, and development and area studies.

Students earning the certificate must participate in the Transnational and Global Studies Seminar. The seminar addresses the most pressing transnational and global issues and is led by faculty with expertise in these fields. This course is taken for either 1 credit or 3 credits: a research paper is needed to earn 3 credits. For more information on the Transnational and Global Studies Certificate, contact Ms. Heather A. Barrett, UF International Center, 170 Hub, P.O. Box 113225, Gainesville FL 32611; Phone (352) 273-1531; E-mail hbarrett@ufic.uf.edu; or visit the website (http://www.tgsc.ufl.edu/).

Tropical Agriculture

The Center for Tropical Agriculture, in the Institute of Food and Agricultural Sciences, seeks to stimulate interest in research and curriculum related to the tropical environment and its development. Website: http://cta.ufl.edu.

Research: International agricultural development assistance contracts frequently have research components. The Center helps coordinate this research.

Minor in tropical agriculture: An interdisciplinary minor in tropical agriculture is available for both master's and doctoral students majoring in agriculture, forestry, and other fields where knowledge of the tropics is relevant. The minor may include courses treating specific aspects of the tropics such as natural resource management (e.g., soils, water, biodiversity), climate, agricultural production, and the languages and cultures of those who live in tropical countries.

Requirements for the minor at the master's level include a minimum of 7 letter-graded credit hours. Six letter-graded credit hours chosen from the list of approved courses with the guidance of the supervisory committee. Selected courses must be from outside the student's major and may not include courses from other academic units which qualify for graduate credit within the home department. One letter-graded credit hour must be a “hands-on” experience in the student's tropical agriculture selected focus. This experience may take the form of a study abroad, internship, field trip, or special project and must have a time equivalent at least equivalent to a 1-credit graded course.

Requirements for the minor at the Ph.D. level include a minimum of 12 letter-graded credits. Selected courses must be from outside the student's major and may not include courses from academic units which qualify for graduate credit within the home department. One letter-graded credit hour must be a “hands-on” experience in the student's tropical agriculture selected focus. This experience may take the form of a study abroad, internship, field trip or special project that must have a time equivalent to a 1 credit letter-graded course. See the list of suggested courses that can be used to meet this requirement. An intent of the minor at the Ph.D. level is to insure each student has an appreciation of the social context within which tropical agriculture is often practiced. To that end, at the discretion of the CTA faculty member, if the student does not have a background that addresses the social context, 3 letter-graded credits may be selected from the social science section of the approved list.

Certificate in Tropical Agriculture (CTA): The certificate emphasizes breadth in topics relevant to tropical agriculture for graduate students (available through the

College of Agricultural and Life Sciences). The CTA prepares students for work requiring knowledge of biological and social aspects of tropical agriculture. Students entering the program receive guidance from members of the CTA Steering Committee regarding course work appropriate for careers in international agricultural development.

The CTA requires at least 12 credits. The “typical” certificate program has 12 to 24 credits. These credits may, with approval from supervisory committees, also count toward the M.S. or Ph.D. While foreign language abilities and work experience in a foreign country are strongly encouraged, they are not requisites for the CTA.

For information or application brochure, contact Dr. Richard E. Litz, Director, Center for Tropical Agriculture, University of Florida, c/o Tropical Research and Education Center, 18905 SW 280th Street, Homestead FL 33031, e-mail relitz@ufl.edu or Dr. Nicholas B. Comerford, Soil and Water Science Department, P.O. Box 110290, University of Florida, Gainesville, FL 32611, E-mail nbc@ufl.edu.

Other activities: The Center seeks broad dissemination of knowledge about tropical agriculture by sponsoring conferences, short courses, and seminars featuring leading authorities on the tropics; publishing books, monographs, and proceedings; and by acquiring materials for the library and the data bank.

Tropical Conservation and Development

The Tropical Conservation and Development Program (TCD), in the Center for Latin American Studies, offers an interdisciplinary graduate certificate and graduate concentration focused on integrative approaches to conservation and development in Latin America and other tropical regions. Both the certificate and concentration are open to students who are interested in acquiring interdisciplinary knowledge and technical skills to pursue a career in conservation and development research and practice. These students must be enrolled in master's or Ph.D. programs in TCD's affiliate academic units at the University of Florida

Course work for the certificate and the concentration includes social science theory, principles of tropical ecology, patterns and trends of tropical resource use and conservation, and research methods. TCD core courses also allow students to gain essential practical skills. Emphasis is on communication and presentation techniques, grant writing, proposal writing, and fundraising; facilitation and conflict management; participatory methods for research and project implementation; and project design, analysis, and evaluation. Summer research, practitioner experiences, and field-based training programs provide learning opportunities outside the classroom.

On completing the certificate or concentration, students should have an in-depth understanding of the relationships among biological conservation, resource management, and the livelihood needs of rural communities; and the appropriate professional skills for a career in research, field practice, or both.

TCD's affiliate academic units are Agricultural Education and Communication, Agronomy, Anthropology, Comparative Law, Botany, Food and Resource Economics, Forest Resources and Conservation, Geography, Geological Sciences, Latin American Studies, Natural Resources and Environment, Political Science, Religion, Sociology, Soil and Water Science, Urban and Regional Planning, Wildlife Ecology and

Conservation, Women's Studies, and Zoology.

Master's students can earn a certificate in TCD by completing 12 credits of approved course work: 2 interdisciplinary core courses and 1 course each in tropical ecology and social science. Ph.D. students can earn a certificate by completing 15 credits of approved course work (3 interdisciplinary core courses and 1 course each in tropical ecology and social science). Students from natural science academic units must take the social science credits outside their major. Otherwise, courses from the student's major can count toward program requirements. Substitutions need prior approval from the TCD faculty adviser.

To earn a concentration in TCD, students must complete the course requirements for the certificate (as explained above) and they must focus on tropical conservation and development in their thesis, dissertation, or final project. One member of the student's supervisory committee must be a TCD affiliate faculty member. This person is responsible for judging whether the student's thesis focuses on tropical conservation and/or development. For the faculty member to make this judgment, the student must articulate in writing how the research fits in the broader context of biodiversity conservation and/or rural development in the tropics. This person cannot count as the external member of the committee.

For more information on the TCD certificate and concentration program, and for a list of approved courses, visit the TCD website (http://www.latam.ufl.edu/tcd), or contact Marianne Schmink, TCD Director, 301 Grinter Hall, (352) 392-6548 ext. 827, E-mail Schmink@latam.ufl.edu.

Tropical Studies

The Organization for Tropical Studies (OTS) is a consortium of 50 major educational and research institutions in the United States and abroad, created to promote understanding of tropical environments and their intelligent use by people. The University of Florida is a charter member. Graduate field courses in tropical biology and ecology, agricultural ecology, population biology, and forestry are offered in Costa Rica and Brazil during spring and summer terms. Students are selected on a competitive basis from all OTS member institutions.

A University of Florida graduate student may register for 8 credits in an appropriate course cross-listed with OTS (e.g., PCB 6357C or AGG 6933). The University of Florida does not require tuition for OTS courses. Registration is on the host campus. However, students on Graduate Assistantships must also be registered at UF. Research grants are available through OTS. For more information, contact University of Florida representatives to the OTS board of directors, Dr. Robert Holt (111 Bartram Hall) and Dr. Hugh Popenoe (2169 McCarty Hall).

Vision Sciences

An interdisciplinary specialization in vision sciences is available through the College of Medicine. The Department of Ophthalmology serves as the administrative and logistical center. However, most of the faculty are from the IDP advanced concentrations. Current interests include retinal gene therapy, gene expression in the mammalian retina and lens, especially during fetal development, biochemistry of vision in vertebrates and invertebrates, biochemistry and neurobiology of wound

healing and neural tissue degeneration, and molecular and cell biology of animal model retinal degeneration. For more information, contact the Program Director, Dr. W. Clay Smith, P.O. Box 100284, College of Medicine, Gainesville FL 32610-0284, Phone (352) 392-0476.

Wetland Sciences

The **Interdisciplinary Concentration in Wetland Sciences (ICWS)** is a unified interdisciplinary program in wetland science and policy for master's and doctoral students.

Graduate faculty from the following academic units contribute to the wetlands sciences concentration: Agricultural and Biological Engineering, Botany, Civil Engineering, Environmental Engineering Sciences, Fisheries and Aquatic Sciences, Forest Resources and Conservation, Geography, Geological Sciences, Landscape Architecture, Law, Soil and Water Sciences, Urban and Regional Planning, Wildlife Ecology and Conservation, and Zoology. Students in any of these programs may elect to participate in the ICWS. A major strength of the ICWS is the breadth of wetlands-related courses and research opportunities in many academic programs across campus. The ICWS exposes students to perspectives outside their disciplines and provides a rigorous, substantive education in wetlands sciences in addition to their disciplinary focus.

Students may complete the ICWS for either the M.S. or Ph.D. degree. A core curriculum (15 credits for M.S. and 18 credits for Ph.D.) provides the opportunity for interdisciplinary training in four broad subject areas:

— wetlands science (1 course each in wetlands ecology, wetland hydrology, and wetlands biogeochemistry),

— wetlands systems,

— wetlands organisms, and

— wetlands policy/law.

Additional course work in a student's disciplinary focus may strengthen the student's knowledge base or allow for specialization in one or more of the areas.

For more information, contact Dr. Mark T. Brown, Director, Howard T. Odum Center for Wetlands, Phelps Lab, P.O. Box 116350, Gainesville FL 32611, Phone (352) 392-2424; or visit the website (http://www.cfw.ufl.edu).

Women's and Gender Studies

Two certificates, one master's degree (thesis or non-thesis option), and a doctoral concentration are offered in women's and gender studies. Participating graduate faculty are from several academic units, campus-wide, including Agricultural and Life Sciences, Anthropology, Counselor Education, English, German and Slavic Studies, History, Journalism and Communications, Latin American Studies, Linguistics, Medicine, Nursing, Philosophy, Psychology, Religion, Romance Languages and Literatures, Sociology, and Teaching and Learning.

The two graduate certificates in women's studies for master's and doctoral students are offered in conjunction with degree programs in other academic units. The Graduate Certificate in Women's Studies and the Graduate Certificate in Gender and Development require specific sets of course work to thoroughly ground students in the discipline. The Graduate Certificate in Women's Studies is a general introduction to the field, and the Graduate Certificate in Gender and Development allows students to focus on issues related to gender, economic development, and globalization.

The doctoral interdisciplinary concentrations in women's and gender studies give graduate students a thorough grounding in the new scholarship produced by the intersection of women's studies and other academic fields. The concentration facilitates analysis and assessment of theories about the role of gender in cultural systems and its intersections with other categories of differences, such as race, ethnicity, religion, class, sexuality, physical and mental ability, age, and economic and civil status. Emphasis is on participating in women's and gender studies research and on providing an intellectual environment for cross-fertilization among disciplines. Women's and gender studies critically explores the role and status of women and men, past and present.

Participating academic units award Ph.D. degrees with an interdisciplinary concentration in women's and gender studies. Study plans are designed by each student's supervisory committee, whose chair is affiliated with women's and gender studies.

Admission requirements are those of the student's home academic unit and college. After admission to the degree-granting academic unit, the application is sent to the Graduate Coordinator of Women's and Gender Studies who chairs an admissions committee.

For more information on the master's degree, see *Fields of Instruction*; or contact the Director, Center for Women's Studies and Gender Research, 3324 Turlington Hall.

For more information:
The Office of Institutional Planning and Research website provides access to the Florida ExpertNet searchable database of Centers and Institutes. Go to http://expertnet.org/index.cfm?fuseaction=CENTERS.advancedSearch and choose "University of Florida" from the "Limit By" drop-down menu toward the bottom of the page. Finally, click "search" for a complete list of UF Interdisciplinary Research Centers.

Oak Ridge Associated Universities

Since 1948, UF students and faculty of the University of Florida have benefited from its membership in Oak Ridge Associated Universities (ORAU). ORAU is a consortium of 98 colleges and universities and a contractor of the U.S. Department of Energy in Oak Ridge, Tennessee. ORAU works with its member institutions to help their students and faculty gain access to federal research facilities throughout the country; to keep its members informed about opportunities for fellowship, scholarship, and research appointments; and to organize research alliances among its members.

Through the Oak Ridge Institute for Science and Education (ORISE), the DOE facility that ORAU operates, undergraduates, graduates, postgraduates, and faculty enjoy

access to a multitude of opportunities for study and research. Students can participate in programs covering a wide variety of disciplines including business, earth sciences, epidemiology, engineering, physics, geological sciences, pharmacology, ocean sciences, biomedical sciences, nuclear chemistry, and mathematics. Appointment and program lengths range from 1 month to 4 years. Many of these programs aim to increase the number of underrepresented minority students pursuing degrees in science- and engineering-related disciplines. A comprehensive list of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the *ORISE Catalog of Education and Training Programs*, which is available at http://www.orau.gov/orise/educ.htm, or by calling either of the contacts below.

ORAU's Office of Partnership Development seeks opportunities for partnerships and alliances among ORAU's members, private industry, and major federal facilities. Activities include faculty development programs, such as the Ralph E. Powe Junior Faculty Enhancement Awards, the Visiting Industrial Scholars Program, consortium research funding initiatives, faculty research, and support programs as well as services to chief research officers.

For more information about ORAU and its programs, contact

1. Dr. Winfred M. Phillips,
Vice President for Research,
ORAU Councilor for the University of Florida;

2. Monnie E. Champion,
ORAU Corporate Secretary
(865) 556-3306; or

3. Visit the ORAU home page at http://www.orau.org.

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The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

UF UNIVERSITY of FLORIDA GRADUATE SCHOOL

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ADMISSION TO THE GRADUATE SCHOOL

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How to Apply

To apply for admission: contact the academic unit of interest for information about admissions procedures. To find websites for academic units, visit http://gradschool.ufl.edu/students/college-department-links.html. Applications that meet minimum standards are referred by Graduate Admissions in the Office of the University Registrar to the graduate selection committees of the various academic units for approval or disapproval. To be admitted to graduate study in a given academic unit, the prospective student must meet the requirements of the unit and the Graduate School. Admission to some programs is limited by the resources available.

Minimum requirements include an earned bachelor's degree from a

regionally accredited U.S. institution or a comparable degree from an international institution. Applicants must have a minimum grade average of B for all upper-division undergraduate work and scores that are acceptable for the program to which the student is applying on the General Test of the Graduate Record Examination (GRE) or on the Graduate Management Admission Test (GMAT). These scores must be used in the context of a holistic credential review process. Some academic units require a reading knowledge of at least one foreign language. Exceptions to the above requirements are made only when these and other criteria, including letters of recommendation, are reviewed by the academic unit, recommended by the college, and approved by the Dean of the Graduate School.

Direct admission to the Graduate School requires a baccalaureate degree from an accredited college or university. Two copies of the official transcripts from all previously attended colleges or universities should accompany all applications: one for the academic unit and one for the Registrar. These transcripts must be received directly from the registrar of the institution where the work was done. Official supplementary transcripts are required as soon as they are available for any work completed after applying for admission.

Admission requirements of an academic unit are often more rigorous than the minimum requirements set by the Graduate School. Because of resource limitations, most academic units do not accept all qualified applicants.

UF is committed to creating a community that reflects the rich racial, cultural, and ethnic diversity of the State of Florida and the United States of America. The greatest challenge in higher education is to enroll students and hire faculty and staff who are members of diverse racial, cultural, or ethnic minority groups. This pluralism enriches the University community, offers opportunity for robust academic dialogue, and contributes to better teaching and research. The University and its components benefit from the richness of a multicultural student body, faculty, and staff who can learn from one another. Such diversity empowers and inspires respect and understanding among us. The University does not tolerate the actions of anyone who violates the rights of another. By policy and practice, the University embodies a diverse community. Our collective efforts lead to a University that is truly diverse and a University that reflects the U.S. population.

The University encourages qualified applicants of both sexes from all cultural, racial, religious, and ethnic groups. The University does not discriminate on the basis of marital status, sexual orientation, disability, or age in admission or access to its programs and activities. The Title IX Coordinator's office is in 145 Tigert Hall (352) 392-6004.

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Admissions Examinations

Graduate Record Examination (GRE): In addition to the General Test of the GRE, some academic units encourage the applicant to submit scores on one or more advanced subject tests. Scores on all tests taken are considered for admission. Applicants with a previous graduate or professional degree or equivalent from a regionally accredited U.S. institution may be exempt from the GRE and undergraduate GPA requirements. Contact the academic unit for specific requirements.

Graduate Management Admission Test (GMAT): Warrington College of Business Administration applicants may substitute satisfactory Graduate Management Admission Test (GMAT) scores for GRE scores. Master of Business Administration (M.B.A.) applicants must submit satisfactory GMAT scores (at least 465). Students applying to the executive Master of Health Administration program in the College of Public Health and Health Professions may substitute the GMAT for the GRE. For more information, contact Educational Testing Service, Princeton NJ 08540.

Graduate study in Engineering: Some programs may use the Fundamentals of Engineering (FE) examination in lieu of the GRE for admitting students into the non-thesis master's degree programs.

Graduate study in Law: Applicants must hold the Juris Doctor or equivalent degree. Consult the Levin College of Law catalog (http://www.law.ufl.edu/programs/) for the specific programs of interest.

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Medical Immunization

Students must complete the University of Florida Mandatory Immunization Health History Form. Specific details and explanations for how to complete the form successfully are included. Read the directions carefully. Please be aware that students will not be able to register for classes until this form is received and approved by the SHCC immunization staff.

UF's Student Health Care Center offers vaccine counseling and education in addition to administering required and recommended vaccinations in accordance with best medical practices for disease prevention. There is a fee for these services.

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Computer Requirement

Access to and on-going use of a computer is required for all students to complete their degree programs successfully. The

University of Florida expects each student entering the junior year, as well as each student new to the university, to acquire computer hardware and software appropriate to his or her degree program. Competency in the basic use of a computer is a requirement for graduation. Class assignments may require use of a computer, academic advising and registration can be done by computer, and official university correspondence is often sent via e-mail.

While the university offers limited access to computers through its computer labs, most students will be expected to purchase or lease a computer that is capable of dial-up or network connection to the Internet, graphical access to the World Wide Web, and productivity functions such as word processing and spreadsheet calculation. Costs of meeting this requirement will be included in financial aid considerations.

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Conditional Admission

Students admitted as exceptions under the 10% waiver rule must present both an upper-division grade point average and their GRE test scores (verbal, quantitative, and analytical writing) with their applications and meet all other criteria including excellent letters of recommendation from colleagues, satisfactory performance in a specified number of graduate courses taken as postbaccalaureate students, and/or practical experience in the discipline for a specified period of time.

For students granted conditional admission to the Graduate School, final admission decisions are deferred for 1 term until requisite examination scores or final records are available.

Students granted conditional admission need to have these conditions communicated to them by the academic unit admitting them. When these conditions are met, the academic unit must notify the student in writing, sending a copy to Graduate Student Records (106 Grinter 392-4643). Eligible course work taken while a student is in conditional status may apply toward the graduate degree.

Students failing to meet any condition of admission are barred from further registration.

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International Students

All international students seeking admission to the Graduate School must submit satisfactory scores on the GRE General Test or GMAT for selected programs.

International students must submit a satisfactory score on one of

the following: TOEFL (Test of English as a Foreign Language: computer=213, paper=550, web=80), IELTS (International English Language Testing System: 6), MELAB (Michigan English Language Assessment Battery: 77) or successful completion of the University of Florida English Language Institute program.

Students who meet the following conditions may be exempt from the English language test requirements:

— International students whose native language is English

— International students who have spent at least 1 academic year in a baccalaureate or post-baccalaureate degree program at a college or university in a country where English is the official language

International students with unsatisfactory scores on the TOEFL, IELTS, MELAB, unsuccessful completion of the University of Florida English Language Institute program, or unsatisfactory scores on the verbal parts of the GRE must achieve an acceptable score on an essay administered by the Academic Written English program at UF. If English skills are not acceptable, then performance on the essay will be used to place students in appropriate courses that will not count towards a graduate degree. To be eligible for teaching assignments, graduate students whose native language is not English must submit satisfactory scores on the Test of Spoken English (TSE) or the SPEAK Test. Students who score 55 or above are allowed to teach in the classroom, laboratory, or other appropriate instructional activity. Those who score 45 to 50 are allowed to teach on the condition that they enroll concurrently in EAP 5836, to help their interpersonal and public speaking communication skills. Students who fail to score 45 points may not be appointed to teach. To raise their scores on the TSE, they are advised to take EAP 5835, a course to improve general oral language skills. They must then submit a TSE or SPEAK score of 45 or higher to be appointed to teach, and they come under the guidelines described above. Applicants should write to the Educational Testing Service, Princeton, NJ 08540, for registration forms and other information on TOEFL, TSE, GMAT, and GRE, or the website at www.ets.org. Information about IELTS can be found at http://www.ielts.org. Information about MELAB can be found at http://www.lsa.umich.edu/eli/testing/melab/general/. Information about the University of Florida English Language Institute is available at www.eli.ufl.edu. Students may register for the locally administered SPEAK test with the Academic Spoken English Office, 3340 Turlington Hall.

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Students with Disabilities

The Disability Resource Center (DRC) at the University of Florida

provides services to students with disabilities in compliance with Section 504 of the Rehabilitation Act of 1973 and Title II of the Americans with Disabilities Act. The DRC works to provide equal access to University programs and services in order to meet the individual needs of students with disabilities. Students are not required to disclose their disability. However, if accommodations are requested, students must register with the Disability Resource Center and provide documentation to verify their disability. Current documentation from a qualified physician or other licensed professional in a field related to the disability is required. At a minimum, the documentation must address:

— Verification of disability,

— Substantial functional limitations noted as a result of the disability on a major life activity,

— Recommendations of possible accommodations. Possible accommodations include note-taking services, accommodated testing, alternative formatted materials, interpreting services, or educational assistants.

For information about services or to set-up an appointment, please call the office at (352) 392-8565 or visit the office in 001 Building 0020 (Reid Hall). Please view the website at http://www.dso.ufl.edu/drc/ for additional information.

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Postbaccalaureate Students

Postbaccalaureate students have a bachelor's degree and have not been admitted to the Graduate School. Admission for postbaccalaureate enrollment requires a recognized baccalaureate degree (or higher) from a regionally accredited college or university, or an international equivalent based on a 4-year curriculum and a minimum C (2.0) GPA on all junior and senior year undergraduate work, as computed by UF.

Proficiency in the English language is required of applicants from countries (including Puerto Rico) where English is not the official language. These applicants must submit official scores from the Test of English as a Foreign Language (TOEFL), International English Language Testing System (IELTS), or the Michigan English Language Assessment Battery (MELAB). This requirement may be waived if you have been enrolled in a degree-seeking program for one academic year (in a country where English is the official language) prior to your anticipated term of enrollment at UF.

A satisfactory conduct record; major or continuing difficulty with school or other officials may make an applicant ineligible, regardless of academic qualifications. In addition, proof of immunization for

measles and rubella or a tuberculosis skin test is required before registering for coursework.

Applicants must ensure that official transcripts are sent to the Office of Admissions from each postsecondary institution attended. Applications will not be reviewed until transcripts have been received by the Office of Admissions.

Complete the postbaccalaureate application (PDF).

Postbaccalaureate students may enroll in graduate courses, but graduate credit is not generally accepted by the Graduate School for transfer. It is possible to transfer up to 15 semester credits of graduate course work earned with a grade of A, A-, B+, or B by petition in clearly justified cases and in conformance with regulations on courses and credit.

Only students who have completed a baccalaureate degree in the College of Education may be admitted to postbaccalaureate status for the purpose of completing a teacher certification program. Other applicants may be admitted to postbaccalaureate status only for a limited time to fulfill prerequisites for admission to a master's program. Applicants with degrees in other fields who are seeking teacher certification, should apply for admission to a master's program in the College of Education.

For more information, visit the Registrar's website, http://www.admissions.ufl.edu/grad/postbacc.html.

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Nondegree Registration

Nondegree enrollment is restricted to participants in special programs, off-campus programs, University-affiliated exchange programs, and those participants with nondegree educational objectives at UF. Students denied admission to UF for any term are not eligible for nondegree registration. Students need prior approval from the academic unit(s) to take courses in a nondegree status. That course work normally is not applied toward the graduate degree if the student is admitted to the Graduate School. By petition in clearly justified cases and in conformance with regulations on courses and credit, it is possible to transfer up to 15 credits of graduate course work earned with the grade of A, A-, B+, or B. A student should not remain in this classification for more than 1 term before being admitted as a postbaccalaureate or graduate student.

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Readmission

This information applies only to students who have previously been admitted to and attended a graduate, postbacc or professional UF program. Former students who do not enroll at the university for two consecutive terms, including any summer term, must apply for readmission.

Students who wish to take a leave of absence for two or more consecutive terms should obtain written approval from their academic units before they leave. Students who skip a single term will be scheduled automatically for a registration appointment for one additional term.

All readmission applicants must meet the current admission requirements of the college or school they expect to enter. Readmission is not guaranteed and is subject to availability at the level, college and major. Consult the appropriate program's admission requirements.

Readmission is for a specific term. If you are unable to enroll for the term for which you have been admitted, you must apply for readmission again to a different term.

The readmission application must be completed via a PDF copy and mailed to the Office of Admissions. The application requires you to indicate the college, level and major at your last enrollment at the university as well as the college, level and/or major you want to apply/return to.

You can complete the form online before printing it or you can print it first and complete it by hand. Then mail the application with the $30 application fee to the

Office of Admissions
P.O. Box 2946, University of Florida
Gainesville, FL 32602-2946

For further information:
http://www.reg.ufl.edu/regadmi.htm

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Faculty Members as Graduate Students

UF faculty in tenured or tenure-accruing lines, as designated by the Florida Administrative Code, normally may not pursue graduate degrees from this institution. Exceptions are made for the Florida Cooperative Extension Service (IFAS) county personnel, the faculty of the P. K. Yonge Laboratory School, and University Libraries faculty. Under certain restrictions established by the Graduate Council, persons holding nontenure- or nonpermanent-status-accruing titles may pursue graduate degrees at UF. Any other exceptions to this policy must be approved by the Graduate Council.

Such exceptions, if given, are rare and will only be approved when it is determined to be in the best interest of the University.

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Residency for Tuition

How to apply for residency

All U.S. citizens, permanent residents and others included in Section 4 of the Board of Education Rule 6a-10.044 above are eligible to apply for Florida residency. Residency for tuition purposes is controlled exclusively by laws enacted by the Florida Legislature. For the purpose of assessing tuition, residency and nonresidency status shall be determined as provided in Classification of Students, Florida or Non-Florida (Section 6A-10.044, Florida Administrative Code), Section 240.1201, Florida Statutes, and the Florida State University System Residency Policy and Procedure Manual [revised effective October 17, 2000]. For the entire law, see http://www.leg.state.fl.us/statutes. Staff members in the Office of the University Registrar review applications for Florida resident status, together with supportive documentation, and render a decision based on the documentation and the requirements of Florida law.

This law, the rules, and the implementation manual presume that students initially classified as nonresident will not be reclassified as residents merely by being enrolled for 1 year. The applicant is responsible for providing all of the documents needed to merit a reclassification for tuition purposes.

A student wishing to establish residency should pick up the Request for Change in Residency Status form from the Office of the University Registrar, 222 Criser Hall, to review the information and items that may be requested when the student files for Florida residency for tuition purposes. The deadline for applying for a change in residency status, including receipt of all documentation, is each term's fee payment deadline. Residency reclassification cannot be applied for retroactively for previous terms.

For updated information and forms please consult
http://www.registrar.ufl.edu/pdf/residencyreclass.pdf
http://www.admissions.ufl.edu/residency/
http://www.registrar.ufl.edu/currents/residencychange.html

1009.21 Determination of resident status for tuition purposes. Students shall be classified as residents or nonresidents for the purpose of assessing tuition in community colleges and state universities.

(1) As used in this section, the term:

(a) "Dependent child" means any person, whether or not living with his or her parent, who is eligible to be claimed by his or her parent as a dependent under the federal income tax code.

(b) "Initial enrollment" means the first day of class at an institution of higher education.

(c) "Institution of higher education" means any community college as defined in s. 1000.21(3) or state university as defined in s. 1000.21(6).

(d) "Legal resident" or "resident" means a person who has maintained his or her residence in this state for the preceding year, has purchased a home which is occupied by him or her as his or her residence, or has established a domicile in this state pursuant to s. 222.17.

(e) "Nonresident for tuition purposes" means a person who does not qualify for the in-state tuition rate.

(f) "Parent" means the natural or adoptive parent or legal guardian of a dependent child.

(g) "Resident for tuition purposes" means a person who qualifies as provided in this section for the in-state tuition rate.

(2)(a) To qualify as a resident for tuition purposes:

1. A person or, if that person is a dependent child, his or her parent or parents must have established legal residence in this state and must have maintained legal residence in this state for at least 12 consecutive months immediately prior to his or her initial enrollment in an institution of higher education.

2. Every applicant for admission to an institution of higher education shall be required to make a statement as to his or her length of residence in the state and, further, shall establish that his or her presence or, if the applicant is a dependent child, the presence of his or her parent or parents in the state currently is, and during the requisite 12-month qualifying period was, for the purpose of maintaining a bona fide domicile, rather than for the purpose of maintaining a mere temporary residence or abode incident to enrollment in an institution of higher education.

(b) However, with respect to a dependent child living with an adult relative other than the child's parent, such child may qualify as a resident for tuition purposes if the adult relative is a legal resident who has maintained legal residence in this state for at least 12 consecutive months immediately prior to the child's initial enrollment in an institution of higher education, provided the child has resided continuously with such relative for the 5 years immediately prior to the child's initial enrollment in an institution of higher education, during which time the adult relative has exercised

day-to-day care, supervision, and control of the child.

(c) The legal residence of a dependent child whose parents are divorced, separated, or otherwise living apart will be deemed to be this state if either parent is a legal resident of this state, regardless of which parent is entitled to claim, and does in fact claim, the minor as a dependent pursuant to federal individual income tax provisions.

(3)(a) An individual shall not be classified as a resident for tuition purposes and, thus, shall not be eligible to receive the in-state tuition rate until he or she has provided such evidence related to legal residence and its duration or, if that individual is a dependent child, evidence of his or her parent's legal residence and its duration, as may be required by law and by officials of the institution of higher education from which he or she seeks the in-state tuition rate.

(b) Except as otherwise provided in this section, evidence of legal residence and its duration shall include clear and convincing documentation that residency in this state was for a minimum of 12 consecutive months prior to a student's initial enrollment in an institution of higher education.

(c) Each institution of higher education shall affirmatively determine that an applicant who has been granted admission to that institution as a Florida resident meets the residency requirements of this section at the time of initial enrollment. The residency determination must be documented by the submission of written or electronic verification that includes two or more of the documents identified in this paragraph. No single piece of evidence shall be conclusive.

1. The documents must include at least one of the following:

a. A Florida voter's registration card.

b. A Florida driver's license.

c. A State of Florida identification card.

d. A Florida vehicle registration.

e. Proof of a permanent home in Florida which is occupied as a primary residence by the individual or by the individual's parent if the individual is a dependent child.

f. Proof of a homestead exemption in Florida.

g. Transcripts from a Florida high school for multiple years if the Florida high school diploma or GED was earned within the last 12 months.

h. Proof of permanent full-time employment in Florida for at least

30 hours per week for a 12-month period.

2. The documents may include one or more of the following:

a. A declaration of domicile in Florida.

b. A Florida professional or occupational license.

c. Florida incorporation.

d. A document evidencing family ties in Florida.

e. Proof of membership in a Florida-based charitable or professional organization.

f. Any other documentation that supports the student's request for resident status, including, but not limited to, utility bills and proof of 12 consecutive months of payments; a lease agreement and proof of 12 consecutive months of payments; or an official state, federal, or court document evidencing legal ties to Florida.

(4) With respect to a dependent child, the legal residence of the dependent child's parent or parents is prima facie evidence of the dependent child's legal residence, which evidence may be reinforced or rebutted, relative to the age and general circumstances of the dependent child, by the other evidence of legal residence required of or presented by the dependent child. However, the legal residence of a dependent child's parent or parents who are domiciled outside this state is not prima facie evidence of the dependent child's legal residence if that dependent child has lived in this state for 5 consecutive years prior to enrolling or reregistering at the institution of higher education at which resident status for tuition purposes is sought.

(5) In making a domiciliary determination related to the classification of a person as a resident or nonresident for tuition purposes, the domicile of a married person, irrespective of sex, shall be determined, as in the case of an unmarried person, by reference to all relevant evidence of domiciliary intent. For the purposes of this section:

(a) A person shall not be precluded from establishing or maintaining legal residence in this state and subsequently qualifying or continuing to qualify as a resident for tuition purposes solely by reason of marriage to a person domiciled outside this state, even when that person's spouse continues to be domiciled outside of this state, provided such person maintains his or her legal residence in this state.

(b) A person shall not be deemed to have established or maintained a legal residence in this state and subsequently to have qualified or continued to qualify as a resident for tuition purposes solely by reason of marriage to a person domiciled in this state.

(c) In determining the domicile of a married person, irrespective of sex, the fact of the marriage and the place of domicile of such person's spouse shall be deemed relevant evidence to be considered in ascertaining domiciliary intent.

(6)(a) Except as otherwise provided in this section, a person who is classified as a nonresident for tuition purposes may become eligible for reclassification as a resident for tuition purposes if that person or, if that person is a dependent child, his or her parent presents clear and convincing documentation that supports permanent legal residency in this state for at least 12 consecutive months rather than temporary residency for the purpose of pursuing an education, such as documentation of full-time permanent employment for the prior 12 months or the purchase of a home in this state and residence therein for the prior 12 months while not enrolled in an institution of higher education.

(b) If a person who is a dependent child and his or her parent move to this state while such child is a high school student and the child graduates from a high school in this state, the child may become eligible for reclassification as a resident for tuition purposes when the parent submits evidence that the parent qualifies for permanent residency.

(c) If a person who is a dependent child and his or her parent move to this state after such child graduates from high school, the child may become eligible for reclassification as a resident for tuition purposes after the parent submits evidence that he or she has established legal residence in the state and has maintained legal residence in the state for at least 12 consecutive months.

(d) A person who is classified as a nonresident for tuition purposes and who marries a legal resident of the state or marries a person who becomes a legal resident of the state may, upon becoming a legal resident of the state, become eligible for reclassification as a resident for tuition purposes upon submitting evidence of his or her own legal residency in the state, evidence of his or her marriage to a person who is a legal resident of the state, and evidence of the spouse's legal residence in the state for at least 12 consecutive months immediately preceding the application for reclassification.

(7) A person shall not lose his or her resident status for tuition purposes solely by reason of serving, or, if such person is a dependent child, by reason of his or her parent's or parents' serving, in the Armed Forces outside this state.

(8) A person who has been properly classified as a resident for tuition purposes but who, while enrolled in an institution of higher education in this state, loses his or her resident tuition status because the person or, if he or she is a dependent child, the person's parent or parents establish domicile or legal residence elsewhere shall continue to enjoy the in-state tuition rate for a

statutory grace period, which period shall be measured from the date on which the circumstances arose that culminated in the loss of resident tuition status and shall continue for 12 months. However, if the 12-month grace period ends during a semester or academic term for which such former resident is enrolled, such grace period shall be extended to the end of that semester or academic term.

(9) Any person who ceases to be enrolled at or who graduates from an institution of higher education while classified as a resident for tuition purposes and who subsequently abandons his or her domicile in this state shall be permitted to reenroll at an institution of higher education in this state as a resident for tuition purposes without the necessity of meeting the 12-month durational requirement of this section if that person has reestablished his or her domicile in this state within 12 months of such abandonment and continuously maintains the reestablished domicile during the period of enrollment. The benefit of this subsection shall not be accorded more than once to any one person.

(10) The following persons shall be classified as residents for tuition purposes:

(a) Active duty members of the Armed Services of the United States residing or stationed in this state, their spouses, and dependent children, and active drilling members of the Florida National Guard.

(b) Active duty members of the Armed Services of the United States and their spouses and dependents attending a public community college or state university within 50 miles of the military establishment where they are stationed, if such military establishment is within a county contiguous to Florida.

(c) United States citizens living on the Isthmus of Panama, who have completed 12 consecutive months of college work at the Florida State University Panama Canal Branch, and their spouses and dependent children.

(d) Full-time instructional and administrative personnel employed by state public schools and institutions of higher education and their spouses and dependent children.

(e) Students from Latin America and the Caribbean who receive scholarships from the federal or state government. Any student classified pursuant to this paragraph shall attend, on a full-time basis, a Florida institution of higher education.

(f) Southern Regional Education Board's Academic Common Market graduate students attending Florida's state universities.

(g) Full-time employees of state agencies or political subdivisions of the state when the student fees are paid by the state agency or

political subdivision for the purpose of job-related law enforcement or corrections training.

(h) McKnight Doctoral Fellows and Finalists who are United States citizens.

(i) United States citizens living outside the United States who are teaching at a Department of Defense Dependent School or in an American International School and who enroll in a graduate level education program which leads to a Florida teaching certificate.

(j) Active duty members of the Canadian military residing or stationed in this state under the North American Air Defense (NORAD) agreement, and their spouses and dependent children, attending a community college or state university within 50 miles of the military establishment where they are stationed.

(k) Active duty members of a foreign nation's military who are serving as liaison officers and are residing or stationed in this state, and their spouses and dependent children, attending a community college or state university within 50 miles of the military establishment where the foreign liaison officer is stationed.

(11) Each institution of higher education shall establish a residency appeal committee comprised of at least three members to consider student appeals of residency determinations, in accordance with the institution's official appeal process. The residency appeal committee must render to the student the final residency determination in writing. The institution must advise the student of the reasons for the determination.

(12) The State Board of Education and the Board of Governors shall adopt rules to implement this section.

Florida Administrative Code

Classification of Students: Florida or Non-Florida
(6A-10.044, Florida Administrative Code) Residency for Tuition Purposes.

The purpose of this rule is to establish consistent policies for the classification of students as residents for tuition purposes in accordance with criteria set forth in Section 1009.21, F.S.

(1) For Initial Determination of Residency:

(a) A dependent student who attended a Florida high school for a minimum of two (2) academic years immediately preceding his or her initial enrollment in an institution of higher education and graduated from a Florida high school or earned a Florida GED within the last twelve (12) months may use their high school transcript or the GED transcript as evidence of Florida residency. At least one (1) additional document identified in Section 1009.21(3)(c)1. or

1009.21(3)(c)2., F.S., must be presented evidencing parental legal residence.

(b) If a declaration of domicile, pursuant to Section 222.17, F.S., is being used as one of the documents to establish residency for tuition purposes, the date that an applicant shall be deemed as establishing residency for tuition purposes shall be twelve (12) months hence from the date that the Clerk of Circuit Court notes the declaration was sworn and subscribed to them. Nothing in this subsection shall prevent the use of additional documentation as evidence that legal residency was established by other means pursuant to Section 1009.21(1)(c), F.S., as of a date earlier than that established by the Declaration of Domicile.

(2) For Residency Reclassification Determination. A student who is classified as a nonresident for tuition purposes may become eligible for reclassification as a resident for tuition purposes by presenting a minimum of three (3) documents identified in Section. 1009.21(3)(c)1. or 1009.21(3)(c)2., F.S., that convincingly demonstrate the establishment of permanent legal residence in Florida other than for the sole purpose of pursuing a postsecondary education. Documentation must demonstrate that the student or, if the student is a dependent, his or her parent, has maintained legal residence in Florida for at least twelve (12) consecutive months prior to his or her request for reclassification.

(3) The burden of providing clear and convincing documentation that justifies the institution's classification of a student as a resident for tuition purposes rests with the student or, if the student is a dependent, his or her parent. For documentation to be "clear and convincing," it must be credible, trustworthy, and sufficient to persuade the institution that the student or, if that student is a dependent, his or her parent has established legal residency in Florida that is not solely for the purpose of pursuing an education and has relinquished residency in any other state for at least twelve (12) consecutive months prior to classification. Each institution of higher education may establish submission deadlines for all documentation that will be used to determine residency for tuition purposes.

(4) A non-United States citizen may be eligible to establish residency for tuition purposes if evidence is presented verifying that he or she is legally present in the United States and the student is one of the following:

(a) A foreign national in a nonimmigrant Visa classification eligible for study and with a date of departure that is not during the term the student will be enrolled. The student, and parent, if the student is a dependent, must present evidence of legal presence in the United States. A Student Visa shall not be accepted as evidence of eligibility to establish residency.

(b) A foreign national, such as permanent resident aliens, parolees, asylees, Cuban-Haitian Entrants, and other legal aliens granted indefinite stay, in a status that is eligible for study in the United States.

(5) Each institution's official residency appeal process established pursuant to Section 1009.21(11), F.S., shall be in writing and prominently displayed on the institution's web site.
Rulemaking Authority 1009.21(11) FS. Law Implemented 1009.21(11) FS. History–New 10-6-92, Amended 10-17-00, 3-22-05, 6-22-10.

Tuition payments

Florida resident tuition payments are available to graduate assistants and fellows who meet the eligibility requirements. Any change in the student's academic or employment status after processing a tuition payment will result in the original payment being updated, reduced, or voided as appropriate.

Non-Florida resident tuition payments are available to out-of-state students who hold graduate assistantships or fellowships and who meet the eligibility requirements. Any change in the student's academic or employment status after processing a tuition payment will result in the original payment being updated, reduced, or voided as appropriate.

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The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

UF UNIVERSITY of FLORIDA GRADUATE SCHOOL

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GENERAL REGULATIONS

The information in this catalog is current as of July 2010. Please contact individual programs for any additional information or changes.

The student is responsible for becoming informed and observing all program regulations and procedures. The student must be familiar with Graduate Catalog general regulations and requirements, specific degree program requirements, and offerings and requirements of the major academic unit. *Rules are not waived for ignorance*. Any exceptions to the policies stated in the Graduate Catalog must be approved by the Dean of the Graduate School. After admission to the Graduate School, but before the first registration, the student should consult the college and/or the graduate coordinator in the major academic unit about courses and degree requirements, deficiencies if any, and special regulations of the academic unit. The dean (or representative) of the college where the degree program is located must oversee all registrations. Once a supervisory committee is appointed, registration approval is the responsibility of the committee chair.

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Catalog Year

Catalog year determines the set of academic requirements that must be fulfilled for graduation. Students graduate under the catalog in effect when they first enroll as degree-seeking students at UF provided they maintain continuous enrollment. Students who are unregistered for 2 or more consecutive terms must reapply for admission and will be assigned the catalog in effect when enrollment is resumed. With the approval of their college dean's office, students may opt to graduate under the requirements of a later catalog, but they must fulfill all graduation requirements from that alternative year. The University will make every reasonable effort to honor the curriculum requirements appropriate to each student's catalog year. However, courses and programs are sometimes discontinued and requirements may change as a result of curricular review or actions by accrediting associations and other agencies.

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Classification of Students

6 - Postbaccalaureate students: degree-holding students admitted to postbaccalaureate credits.

7 - Graduate students seeking a first master's degree.

8 - Graduate students who have earned a master's degree, or who have earned 36 or more credits while seeking a graduate degree, but who have not been admitted to doctoral candidacy.

9 - Graduate students admitted to doctoral candidacy.

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Confidentiality of Student Records

The University ensures the confidentiality of student educational records in accordance with State University System rules, state statutes, and FERPA, the Family Educational Rights and Privacy Act of 1974, as amended, also known as the Buckley Amendment.

Student directory information that can be released to the public is limited to:

— Student name

— Local/permanent addresses and e-mail address
— Listed telephone number(s)
— Class and college
— Major
— Enrollment status (e.g., undergraduate or graduate level; full time or part time)
— Dates of attendance at UF
— Degree(s) and awards received at UF
— Most recent previous educational institution attended
— Weight and height of university athletes
__ Publication titles (theses and dissertations)
__ Nature and place of employment at UF

Currently enrolled students must contact the appropriate agency/agencies **to restrict release of directory information**. The Office of the University Registrar, the Department of Housing and Residence Education, and Human Resource Services routinely release directory information to the public. Directory information may also be released by other university departments and/or employees.

— Students who want to restrict directory information must do so at the Office of the University Registrar in 222 Criser Hall.
— Students who live on campus also must request this restriction from the Department of Housing and Residence Education.
— Students who are also University employees must request this restriction from Human Resource Services.
— Students who do not want their addresses, phone numbers or personal information published on the Web should update their directory profile accordingly.

Student **educational records may be released** without a student's consent to school officials who have a legitimate educational interest in accessing the records. "School officials" shall include:

— An employee, agent or officer of the university or State University System of Florida in an administrative, supervisory, academic, research, or support staff position;
— Persons serving on university committees, boards and/or councils; and
— Persons employed by or under contract to the university to perform a special task, such as an attorney or an auditor.

"Legitimate educational interest" shall mean any authorized interest or activity undertaken in the name of the university for which access to an educational record is necessary or appropriate to the operation of the university or to the proper performance of the educational mission of the university. The university also may disclose information from a student's educational record without a student's consent to either individuals or entities permitted such

access under applicable federal and state law.

Students have the right to review their own educational records for information and to determine accuracy. A photo I.D., other equivalent documentation or personal recognition by the custodian of the record will be required before access is granted. Parents of dependent students, as defined by the Internal Revenue Service, have these same rights upon presentation of proof of a student's dependent status. Each year when the catalog is published, students are notified of their FERPA rights.

If a student believes the educational record contains information that is inaccurate, misleading or in violation of his or her rights, the student can ask the institution to amend the record. The UF Student Guide outlines the procedures for challenging the content of a student record, as well as the policies governing access to and maintenance of student records.

Students who believe the university has not maintained the confidentiality of their educational record as required by law may file a complaint by contacting the Family Policy Compliance Office, U.S. Department of Education, 400 Maryland Avenue SW, Washington, DC 20202-5920.

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Academic Honesty

In 1995, the UF student body enacted an honor code and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to the standard drafted and enacted by students.

Preamble: In adopting this honor code, the students of the University of Florida recognize that academic honesty and integrity are fundamental values of the university community. Students who enroll at the university commit to holding themselves and their peers to the high standard of honor required by the honor code. Any individual who becomes aware of a violation of the honor code is bound by honor to take corrective action. The quality of a University of Florida education is dependent upon community acceptance and enforcement of the honor code.

The Honor Pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

On all work submitted for credit by students at the university, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

The university requires all members of its community to be honest

in all endeavors. A fundamental principle is that the whole process of learning and pursuit of knowledge is diminished by cheating, plagiarism and other acts of academic dishonesty. In addition, every dishonest act in the academic environment affects other students adversely, from the skewing of the grading curve to giving unfair advantage for honors or for professional or graduate school admission. Therefore, the university will take severe action against dishonest students. Similarly, measures will be taken against faculty, staff and administrators who practice dishonest or demeaning behavior.

Student Responsibility: Students should report any condition that facilitates dishonesty to the instructor, department chair, college dean or Student Honor Court.

Faculty Responsibility: Faculty members have a duty to promote honest behavior and to avoid practices and environments that foster cheating in their classes. Teachers should encourage students to bring negative conditions or incidents of dishonesty to their attention. In their own work, teachers should practice the same high standards they expect from their students.

Administration Responsibility: As highly visible members of our academic community, administrators should be ever vigilant to promote academic honesty and conduct their lives in an ethically exemplary manner.

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Student Conduct Code

Students enjoy the rights and privileges that accrue to membership in a university community and are subject to the responsibilities that accompany that membership. For a system of effective campus governance, it is incumbent upon all members of the campus community to notify appropriate officials of any violations of regulations and to assist in their enforcement. The University's conduct regulations available to all students in the Student Guide are set forth in Florida Administrative Code. Questions can be directed to the Dean of Students Office.

Alcohol and Drugs

The use of alcohol and other drugs can have a negative impact on judgments and reactions, health and safety, and may lead to legal complications as well.

The university's principal role is to engage in education that leads to high standards and respectful conduct. When those are compromised, the university will take disciplinary action against organizations and individuals violating either the law or the unreasonable use of alcohol. It also must provide help for students who are alcohol-dependent. The university will deal severely with students convicted of the illegal possession, use or sale of drugs.

What the university community can do to prevent alcohol abuse and drug use: Students can help control substance abuse by declining to use or to condone the use of drugs and by insisting that organizations and individuals use alcohol within the bounds of the law and reasonable conduct. Students should make an effort to prevent persons who have abused alcohol or used drugs from harming themselves or others, especially while driving a motor vehicle. They should encourage those needing professional help to seek it. The same standards and regulations apply equally to faculty, staff and administration.

Relations Between People and Groups

One of the major benefits of higher education and membership in the university community is greater knowledge of and respect for other religious, racial and cultural groups. Indeed, genuine appreciation for individual differences and cultural diversity is essential to the environment of learning. Another major aspect of university life involves sexual relationships. Sexual attitudes or actions that are intimidating, harassing, coercive or abusive, or that invade the right to privacy of the individual are not acceptable. Organizations or individuals that adversely upset the balance of communal living are subject to university disciplinary action. Only in an atmosphere of equality and respect can all members of the university community grow.

Service to Others

An important outcome of a University of Florida education should be a commitment to serving other people. This sense of service should be encouraged throughout the institution by faculty, administration, staff and students. Through experience in helping individuals and the community, students can put into practice the values they learn in the classroom.

Standard of Ethical Conduct

Honesty, integrity and caring are essential qualities of an educational institution, and the concern for values and ethics is important to the whole educational experience. Individual students, faculty and staff members, as well as the university's formal organizations, must assume responsibility for these qualities. The concern for values and ethics should be expressed in classes, seminars, laboratories and in all aspects of university life. By definition, the university community includes members of the faculty, staff and administration as well as students.

Education at the University of Florida is not an ethically neutral experience. The university stands for, and seeks to inculcate, high standards. Moreover, the concern for values goes well beyond the observance of rules.

A university is a place where self-expression, voicing disagreement and challenging outmoded customs and beliefs are prized and honored. However, all such expressions need to be civil, manifesting

respect for others.

As a major sector in the community, students are expected to follow the university's rules and regulations that, by design, promote an atmosphere of learning. Faculty, staff and administrators are expected to provide encouragement, leadership and example. While the university seeks to educate and encourage, it also must restrict behavior that adversely affects others. The Standard of Ethical Conduct summarizes what is expected of the members of the university community.

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Registration Requirements

The University of Florida operates on a semester system consisting of two 16-week terms and two 6-week summer terms. One semester credit equals 1.5 quarter credits. "Term" is used hereafter, instead of "semester".

Required Full-Time Registration

	Fall and Spring	Summer A	Summer B	Summer C
Full-time graduate students not on appointments	9-12	4	4	8
Fellows receiving $4,000 or more per term, and trainees	12	4	4	8
Assistants on .25 to .74 FTE	9	3	3	6
Assistants on .75 to .99 FTE	6	2	2	4
Full-time assistants:				
1.00 Fall & Spring	3			
1.00 Summer A		2	or	2
1.00 Summer B			2 or	2
1.00 Summer C		1 and	1 or	2

Graduate students on appointment: Required registration for fellows and trainees with stipends of $4,000 or greater per term (prorated for Summer) is 12 credits for Fall and Spring, 8 credits for Summer. Fellows whose stipends are less than $4,000 must register for at least 3 credits during fall and spring terms, and 2 credits for summer. Any additional credits are at the expense of the student. The full-time registration requirement is reduced for students who are graduate assistants. For students on appointment for the full summer, registration must total that specified for C term. Registration may be in any combination of A, B, or C terms. However, courses must be distributed so that the student is

registered during each term on appointment. Students on appointment are financially liable for excess credits beyond the required registration. If a student on appointment drops below the required registration at any time in the semester, the student becomes financially liable for the entire registration. Students who do not register properly are not permitted to remain on appointment.

Full-time registration is 9 to 12 credits. However, most fellows must be registered for 12 credits in fall or spring and 8 credits in summer. Students not on an appointment may want to enroll full time to finish their degrees in the minimum time frame or may be required to enroll full time by external funding agencies or their academic units.

Full-time equivalent is required or prescribed registration; fewer than 9 to 12 credits but considered appropriate in specific circumstances. This includes students on a .25 to 1.00 FTE assistantship and other limited circumstances. See the Graduate Council Policy Manual. Lockstep programs such as M.B.A. are defined as cohorts who move together in the same enrollment sequence with courses taught in a particular order, on a particular schedule. Students have no flexibility in their program or sequence, and may not drop in and out of courses independently. On academic unit request, the Graduate School will certify specified students as full-time equivalent under the circumstances stated in the Graduate Council Policy Manual.

Part-time registration: Students not on an appointment and without a specific registration requirement by the government, external funding agency, or academic unit may register as a part-time student. Minimum registration is 3 credits in fall or spring and 2 credits in summer.

Employee registration: UF staff employed on a permanent, full-time basis may be permitted to waive fees up to a maximum of 6 credits per term on a space-available basis. Enrollment is limited to courses that do not increase direct costs to the University. Courses that increase direct costs can include TBA (to be arranged), computer courses, individualized courses, distance learning, internships, and dissertation and master's thesis courses. Laboratory courses are permitted on a space available basis.

For updated information visit the Human Resource Services website: http://www.hr.ufl.edu/.

Undergraduate registration in graduate courses: Upper-division undergraduate students may enroll in 5000-level courses with consent of the instructor. Normally, a student must have a GPA of at least 3.00. To enroll in 6000-level courses, a student must have senior standing, consent of the instructor, and an upper-division GPA of at least 3.00.

After a student is accepted to graduate school, up to 15 credits of graduate-level courses earned with a letter grade of B or better taken under this provision may be applied toward a graduate degree at UF, if credit for the course has not been used for an undergraduate degree, and if the transfer is approved by the academic unit and made as soon as the student is admitted to a graduate program.

Final term registration: During the term the final examination is given and during the term the degree is awarded, a student must be registered for at least 3 credits in fall or spring and 2 credits in summer. Thesis students must enroll in 6971 and doctoral students must enroll in 7980. Non-thesis students must enroll in course work that counts toward the graduate degree. Students on a fellowship, traineeship, or assistantship must be registered appropriately for their appointments.

Cleared prior: Clearing prior is a possibility only for Thesis and Dissertation students who have met all published deadlines for the current term except Final Clearance from the Graduate Editorial Office. No other students are eligible. Clear Prior permits students to be exempt from registration for the term in which the degree will be awarded. Although not required to register during the term of degree award, students are required to file a new degree application for that term within all published deadlines for doing so, as degree applications do not carry over from semester to semester and are essential for the degree to be awarded.

A student requesting to clear prior must meet ALL of the following criteria:

1. Student has successfully submitted a degree application for the current term within the published deadlines, as confirmed by print screen available from ISIS.

2. Student has appropriately satisfied the current term registration.

3. Student has successfully met the current term first submission deadlines for the thesis or dissertation, as confirmed by the Editorial Office, via a confirmation e-mail to the student and committee chair.

4. Student has successfully met all other degree and administrative requirements, within the published deadlines for the current term.

5. Student is in the process of finalizing the thesis or dissertation with the Graduate School Editorial Office. No other students are eligible.

6. Student has filed a Graduation Date Change Form by the last day of classes of the current term with the Registrar's Office.

Drop/add: Courses may be dropped or added during drop/add without penalty. This period usually lasts 5 UF calendar days or 3 days for summer, starting with the first day of the term. Classes that meet for the first time after drop/add may be dropped without academic penalty or fee liability by the end of the next business day after the first meeting. This does not apply to laboratory sections. After this period, a course may be dropped and a W appears on the transcript. **Students become financially liable for any course added or dropped after the deadline, including students with fee waivers.** Prior to the last day of classes for each term, students should personally verify all registration changes and any required adjustments. Retroactive drop/add will not be permitted.

Retaking courses: Graduate students may repeat courses in which they earn failing grades. Grade points from both the initial failed attempt and the first attempt earning a grade of C or better are included in computing the grade point average. The student receives credit for the satisfactory attempt only.

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Tuition/Fee Waivers

Tuition waivers which accompany fellowships greater than $4000 per term (prorated for Summer) or assistantships .25 FTE or greater will apply to the required registration credits. These credits must count toward the degree and do not include audited courses, correspondence work, DOCE courses, or courses designated as "self-funded" by the registrar.

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Attendance Policies

Students are responsible for meeting all academic objectives as defined by the instructor. Absences count from the first class meeting. In general, acceptable reasons for absences from class include illness, serious family emergencies, special curricular requirements, military obligation, severe weather conditions, religious holidays, and participation in official University activities. Absences from class for court-imposed legal obligations (e.g., jury duty or subpoena) must be excused. Other reasons also may be approved.

Students may not attend classes unless they are registered officially or approved to audit with evidence of having paid audit fees. After the end of drop/add, the Office of the University Registrar provides official class rolls/addenda to instructors. Students who do not attend at least one of the first 2 class meetings of a course or laboratory in which they are registered and who have not contacted the academic unit to indicate their intent may be dropped from the

course. **Students must not assume that they will automatically be dropped if they fail to attend the first few days of class.** The academic unit will notify students dropped from courses or laboratories by posting a notice in the academic unit office. Students may request reinstatement on a space-available basis if documented evidence is presented. The University recognizes the right of the individual professor to make attendance mandatory. After due warning, professors may prohibit further attendance and then assign a failing grade for excessive absences. Students who have registration changes, at any time during the semester, should verify their registrations before the last day of class of the term. Retroactive drop/add or other registration changes will not be permitted.

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Change of Graduate Degree Program

To change majors or degree level (same or different college), the academic unit must submit a Change of Graduate Degree Program for Graduate Students via the Graduate Information Management System (GIMS) to the Graduate School. The form must be signed by an authorized representative of the new academic unit and college, and then submitted to the Graduate School for processing. **Any changes to degree programs, including thesis/non-thesis/project option, MUST occur before the published midpoint deadline of the student's final term.**

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Courses and Credits

Undergraduate courses (1000-2999) may not be used as any part of the graduate degree requirements. All 1000- and 2000-level courses may be taken on a satisfactory/unsatisfactory (S/U) basis.

Six credits of undergraduate courses (3000-4999) outside the major may count when taken as part of an approved graduate program. Consult the Academic Unit before registering.

Courses numbered 5000 and above are limited to graduate students, with the exception described under *Undergraduate Registration in Graduate Courses*. Courses numbered 7000 and above are normally for advanced graduate students.

No more than 5 credits each of 6910 (Supervised Research) and 6940 (Supervised Teaching) may be taken by a graduate student at UF. Students who have taken 5 credits of 6910 cannot take 7910; the rule also applies to 6940 and 7940. Courses numbered 7979 and 7980 are not eligible to count toward a master-level degree program.

Audited courses at any level do not count toward any graduate

degree requirements.

For a complete list of approved graduate courses, see *Fields of Instruction*. Academic units decide which of these graduate courses to offer in a given term. Contact the academic unit for information on available courses.

Generally, graduate courses may not be repeated for credit. However, there is no limit on courses numbered 6971, 6972, 6979, 7979, and 7980. Other courses repeated for credit indicate "max" **after the single term credit**, as listed in *the Fields of Instruction.*

Professional work: Graduate students may receive credit toward their degrees for courses in professional programs (e.g., J.D., D.V.M., or M.D.) when their advisers and graduate coordinators certify that the course work is appropriate for their programs and when the students receive permission from the academic units and colleges offering the courses. A list of such courses for each student must be filed with Graduate Student Records (106 Grinter) and is limited to a maximum of 9 credits toward the master's degree and 30 credits toward the doctorate.

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Grades

Passing, Non-Punitive and Failing Grades: The Office of the University Registrar records student grades. The word "credit" refers to one semester hour, generally representing one hour per week of lecture or two or more hours per week of laboratory work.

The only passing grades for graduate students are A, A-, B+, B, B-, C+, C, and S. Grades of C+ and C count toward a graduate degree if an equal number of credits in courses numbered 5000 or higher have been earned with grades of B+ and A, respectively. Grade points are not given for S and U grades; S and U grades are not used to calculate grade point averages. All letter-graded courses eligible to count toward the graduate degree, except 1000- and 2000-level courses, are used to calculate the cumulative grade-point average. Letter grades of C-, D+, D, D- or E are not considered passing at the graduate level, although the grade points associated with these letter grades are in included in grade point average calculations.

Satisfactory/Unsatisfactory: Grades of S and U are the only grades awarded in courses numbered 6910 (Supervised Research), 6940 (Supervised Teaching), 6971 (Research for Master's Thesis), 6972 (Engineer's Research), 7979 (Advanced Research), and 7980 (Research for Doctoral Dissertation). Additional courses for which S and U grades apply are noted in the academic unit offerings in the *Fields of Instruction* section of the catalog.

All language courses regardless of level may be taken S/U if the

student's major is not a language and the courses are not used to satisfy a minor, with approval from the student's supervisory committee chair and the instructor of the course. S/U approval should be made by the published deadline date. All 1000 and 2000 level courses may be taken S/U. No other courses (graduate, undergraduate, or professional) may be taken for an S/U grade.

Deferred grade H: The grade of H is not a substitute for a grade of S, U, or I. Courses for which H grades are appropriate must be so noted in their catalog descriptions, and must be approved by the Graduate Curriculum Committee and the Graduate School. This grade may be used only in special situations where the expected unit of work may be developed over a period of time greater than a single term. All grades of H must be removed before a graduate degree can be awarded.

Incomplete grades: Grades of I (incomplete) received during the preceding term should be removed as soon as possible. Grades of I carry no quality points and become punitive after 1 term. All grades of I must be removed before a graduate degree can be awarded.

Grades and Grade Points Prior to Summer A 2009

A = 4.0
B+ = 3.5
B = 3.0
C+ = 2.5
C = 2.0
D+ = 1.5
D = 1.0
E = 0
WF = 0
I = 0
NG = 0
S-U = 0

Grades and Grade Points Effective Summer A 2009

A = 4.0
A- = 3.67
B+ = 3.33
B = 3.0
B- = 2.67
C+ = 2.33
C = 2.0
C- = 1.67
D+ = 1.33
D = 1.0
D- = .67
E = 0
WF = 0

I = 0
NG = 0
S-U = 0

Note: The degree-granting college may require a minimum grade of C in particular courses.

Non-Punitive Grades and Symbols:
Zero Grade Points Not Counted in GPA

W = Withdrew
U = Unsatisfactory
H = Deferred grade assigned only in approved sequential courses or correspondence study
N* = No grade reported
I* = Incomplete

Failing Grades:
Zero Grade Points Counted in GPA

E = Failure
WF = Withdrew failing
NG = No grade reported
I = Incomplete

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Unsatisfactory Progress or Unsatisfactory Scholarship

Any graduate student may be denied further registration if progress toward completing the program becomes unsatisfactory to the academic unit, college, or Dean of the Graduate School. Unsatisfactory scholarship is defined as failure to maintain a B average (3.00) in all work attempted. Graduate students need an overall GPA of 3.00 truncated and a 3.00 truncated GPA in their major (and in the minor, if a minor is declared) at graduation. Students with less than a 3.00 GPA may not hold an assistantship or fellowship.

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Foreign Language Examination

A foreign language examination is not required for all degree programs. For specific information on foreign language requirements, contact the graduate coordinator of your academic unit.

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Examinations

The student must register for sufficient and appropriate graduate credits during the term any examination is taken. The student's

supervisory committee is responsible for administering the written and oral qualifying examinations and the final oral examination for the defense of the thesis, project, or dissertation.

All members of the supervisory committee must sign the appropriate forms, including the Electronic Thesis and Dissertation (ETD) Signature Page, for the student to meet the requirements of the examination. The signed forms are to remain in the student's folder in the academic unit. Electronic information will be sent to the Graduate School via the Graduate Information Management System (GIMS) for the Final Exam Form and UF Publishing Agreement, once the student successfully defends. The signed ETD Signature Page should be held by the Academic Unit until all Committee stipulations have been met regarding the document; however, it should be posted electronically to GIMS no later than the Final Clearance Deadline for the intended term of degree award.

The qualifying and comprehensive oral examinations and the oral defense of a thesis, project or dissertation may be conducted using video and/or telecommunications. However, the student and chair or co-chair must be in the same physical location. All other members may participate from remote sites via technological means.

Supervisory Committees or academic units may set their own standards for attendance at oral examinations that exceed the minimum requirement stated above.

Students are responsible for coordinating the scheduling of oral examinations with their committee or academic unit and must follow the policies set by their committee or academic unit, and the Graduate School.

The written comprehensive examination for the non-thesis master's degree may be taken at a remote site. All other qualifying and final examinations for graduate students must be held on the University of Florida campus. Exceptions to this policy are made only for certain graduate students whose examinations are administered at the Agricultural Research and Educational Centers or on the campuses of the universities in the State University System.

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Preparation for Final Term

The student is responsible for meeting all requirements and observing every deadline. Deadlines are given in this catalog, in the Graduate Student Handbook, and online at the Graduate School website.

When the thesis or dissertation is ready to be put in final form for submission to the Graduate School, the student should review the

Format Requirements of the Graduate School Editorial Office and should work with the Application Support Center to format the document in order to meet the minimum first submission requirements of the Editorial Office. The Application Support Center offers students assistance with troubleshooting their documents free of charge. The Center also provides more extensive formatting and pdf-conversion services for reasonable fees to the student. It is highly recommended that all students writing theses and dissertations use their services, in order to alleviate some of the stress felt during the approval process. Students must also file a Degree Application with the Office of the University Registrar at the start of the final term and must meet minimum registration requirements.

Degree Applications DO NOT carry over from one semester to the next. If the degree is not awarded, the student must 1) file The Graduation Date Change Form with the Registrar's office at 222 Criser Hall, before the end of the non-graduating term; 2) RE-APPLY for the degree award via ISIS in a subsequent term, by the published deadline for that term; and 3) meet all other requirements for the term the degree will be awarded. These requirements also apply when a thesis or dissertation student has been approved to clear prior by the Graduate School Editorial Office.

Verification of Degree Candidate Status

This service is provided until 3 weeks before graduation. However, students who before that time have completed all requirements for the degree, filed the fully signed final examination report in GIMS and achieved final clearance of the thesis or dissertation, may request verification to that effect. Verification of Degree Candidate Status Request Forms are filled out by the candidate; signed by the supervisory committee chair, department chair, college dean, and the Graduate School Editorial Office (224 HUB); then given to Graduate Student Records (160 Grinter), for verification and processing.

Although a student may have fulfilled academic requirements, the degree is not awarded until the Graduate School certifies the degree to the University Registrar. That is done at the end of Fall, Spring, and Summer C terms for all students who completed degree requirements and applied to graduate. Some employers and licensure boards require the degree statement on the transcript, which is available about 3 days after certification in December, May, and August.

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Awarding of Degrees

The Graduate School authorizes a candidate to be awarded the

degree appropriate to the course of study under the following conditions (see degree descriptions for details):

— The candidate must have completed all course requirements, including an internship or practicum if required, in the major and minor fields while observing time limits and limitations on transfer credit, on nonresident work, and on level of course work.

— The candidate's grade point average must be at least B (3.00, truncated) in the major and in all work attempted in the graduate program, including a minor where appropriate. All grades of I, H, and X must be resolved. Grades of I, X, C-, D+, D, D-, E, and U require a written petition from the Academic Unit to the Dean of the Graduate School.

— The candidate must have satisfactorily completed all required examinations (qualifying, comprehensive, and final) and be recommended for the degree by the supervisory committee, major academic unit, and college.

— The dissertation or thesis must have been approved by the supervisory committee and accepted by the Graduate School. Projects must be approved by the academic unit, which then certifies completion to the Graduate School.

— Recommendations for awarding a degree include meeting all academic and professional qualifications as judged by the faculty of the appropriate academic unit.

— All requirements for the degree must be met while the candidate is a registered graduate student. Degrees are certified 3 times per year: December, May, and August.

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Attendance at Commencement

Graduates who are to receive advanced degrees are urged to attend Commencement to accept in person the honor indicated by the appropriate hood. Through the University Bookstore, the student may arrange to rent or buy the proper academic attire to be worn at Commencement.

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Google Search

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Graduate Catalog

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FINANCIAL INFORMATION AND REQUIREMENTS

The information in this catalog is current as of July 2010. Please contact individual programs for any additional information or changes.

Fees
General Fiscal Information
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Fees

Application Fee

An individual who applies for admission to the University of Florida shall pay a nonrefundable application fee of $30.00. While personal checks are accepted, the preferred method of payment is an online MasterCard, Visa, or American Express credit card payment, which can be transmitted electronically on ISIS, the university's secure web site. Please note that if paying by credit card, a $1.75 service fee will automatically be added to the $30 fee, so the total application fee is $31.75.

Application fee waivers are provided for the following programs when proof of participation is provided: Florida A & M University (FAMU) Feeder participants, and for students applying through the Florida Fund for Education McKnight Doctoral Fellowship.
For details, contact the Office of Graduate Minority Programs
(352) 392-6444 or (800) 753-9798
115 Grinter Hall
P.O. Box 115500

e-mail ogmp@ufl.edu

Registration and Tuition Fees Liability

Pursuant to Section 6C1-3.037(1) Regulations of the University of Florida, registration shall be defined as consisting of two components: a) formal enrollment in one or more credit courses approved and scheduled by the university; and b) fee payment or other appropriate arrangements for fee payment (deferment or third-party billing) for the courses in which the student is enrolled as of the end of drop/add.

Registration must be completed on or before the date specified in the university calendar. Students are not authorized to attend class unless they are on the class roll or have been approved to audit. Unauthorized class attendance will result in tuition fee liability.

A student must be registered during the terms of the qualifying examination and the final examination, and during the term the degree is awarded.

Tuition Fee Liability--Pursuant to Section 6C1-3.037(2) Regulations of the University of Florida, a student is liable for all tuition fees associated with all courses for which the student is registered, at the end of the drop/add period or for which the student attends after that deadline. The fee payment deadline is 3:30 p.m., at the end of the second week of classes.

Assessment of Tuition Fees

Pursuant to Section 6C1-3.0375(1) Regulations of the University of Florida, tuition shall be assessed on residency, first enrolled term of the current degree, course level and program. Tuition fees are established in late July for the next academic year. In some instances, tuition waivers accompanying assistantships or fellowships include only the matriculation fee and where applicable the nonresident fee. All other fees must be paid by the student.

Pre-Fall 2005 Tuition Fee Criteria

--A degree-seeking student admitted and enrolled before Fall 2005 and enrolled Spring and/or Summer 2005.
--Pre-Fall 2005 status ends upon receipt of a degree in Fall 2005 or thereafter.
--Pre-Fall 2005 status also ends upon the student's admission or readmission to a degree program requiring a new application.

Fall 2005 Tuition Fee Criteria

--A first-time admitted and enrolled degree-seeking student registered for Fall 2005, Spring 2006 or a Summer 2006 term.
--A UF graduate admitted to a new degree program for Fall 2005, Spring 2006 or a Summer 2006 term requiring a new application.
--A former student who is readmitted for Fall 2005, Spring 2006 or

a Summer 2006 term after an absence of two or more consecutive terms, excluding military withdrawals.

Fall 2006 Tuition Fee Criteria
--A first-time admitted and enrolled degree-seeking student registered for Fall 2006, Spring 2007 or a Summer 2007 term.
--A UF graduate admitted to a new degree program for Fall 2006, Spring 2007 or a Summer 2007 term.
--A former student who is readmitted Fall 2006, Spring 2007 or a Summer 2007 term after an absence of two or more consecutive terms, excluding military withdrawals.

Fall 2007 Tuition Fee Criteria
--A first-time admitted and enrolled degree-seeking student registered for Fall 2007, Spring 2008 or a Summer 2008 term.
--A UF graduate admitted to a new degree program for Fall 2007, Spring 2008 or a Summer 2008 term.
--A former student who is readmitted Fall 2007, Spring 2008 or a Summer 2008 term after an absence of two or more consecutive terms, excluding military withdrawals.

Fall 2008 Tuition Fee Criteria
--A first-time admitted and enrolled degree-seeking student registered for Fall 2008, Spring 2009 or a Summer 2009 term.
--A UF graduate admitted to a new degree program for Fall 2008, Spring 2009 or a Summer 2009 term.
--A former student who is readmitted Fall 2008, Spring 2009 or a Summer 2009 term after an absence of two or more consecutive terms, excluding military withdrawals.

Fall 2009 Tuition Fee Criteria
--A first-time admitted and enrolled degree-seeking student registered for Fall 2009, Spring 2010 or a Summer 2010 term.
--A UF graduate admitted to a new degree program for Fall 2009, Spring 2010 or a Summer 2010 term.
--A former student who is readmitted Fall 2009, Spring 2010 or a Summer 2010 term after an absence of two or more consecutive terms, excluding military withdrawals.

Fall 2010 Tuition Fee Criteria
--A first-time admitted and enrolled degree-seeking student registered for Fall 2010, Spring 2011 or a Summer 2011 term.
--A nondegree-seeking student,
--A UF graduate admitted to a new degree program for Fall 2010, Spring 2011 or a Summer 2011 term.
--A former student who is readmitted Fall 2010, Spring 2011 or a Summer 2011 term after an absence of two or more consecutive terms, excluding military withdrawals.

To estimate your tuition fees and determine your student status, visit http://www.fa.ufl.edu/ufs/cashiers/feecalc.asp.

For purposes of discussion, the word term refers to the fall semester, the spring semester and any of the summer sessions.

Students can calculate and pay their own tuition fees on myUFL. Lack of written notification of the tuition fee debt does not negate the student's responsibility to pay by the published deadline. **University personnel will not be held accountable for assessment or accuracy of calculations.**

Assessment of Student Fees

Activity and Service Fee (6C1-3.3072 Regulations of the University of Florida): All students must pay an activity and service fee that is assessed on a per credit hour basis and is included in the basic rate per credit hour.

Athletic Fee (6C1-3.3072 Regulations of the University of Florida): All students must pay an athletic fee that is assessed on a per credit hour basis and is included in the basic rate per credit hour. Graduate research and teaching assistants enrolled for eight (8) or more credit hours during the fall or spring semesters and all other students enrolled for nine (9) or more credits can purchase athletic tickets at the student rate.

Health Fee (6C1-3.0372 Regulations of the University of Florida): All students must pay a health fee that is assessed on a per credit hour basis and is included in the basic rate per credit hour. The health fee maintains the university's Student Health Care Center and is not part of any health insurance a student may purchase.

Technology Fee (6C1-3.3072 Regulations of the University of Florida): All students must pay a technology fee that is assessed on a per credit hour basis and is included in the basic rate per credit hour.

Transportation Access Fee (UF-3.009 Regulations of the University of Florida): All students must pay a transportation access fee that is assessed on a per credit hour basis and is included in the basic rate per credit hour.

Material and supply fee (6C1-3.0374 UF rules): Material and supply fees are assessed for certain courses to offset the cost of materials or supply items consumed in the course of instruction. Material and supply fee information is available from the academic departments.

Audit Fee (6C1-3.0376(18) Regulations of the University of Florida): Tuition fees for audited courses are assessed at the applicable resident or non-resident cost as set forth in Regulation 6C1-3.0375.

Diploma Replacement Fee (6C1-3.0376(13) Regulations of the University of Florida): Each diploma ordered after a student's initial

degree application can result in a diploma replacement charge not to exceed $10.

Transcript Fee (6C1-3.0376(12) Regulations of the University of Florida): A complete transcript for current undergraduate, graduate and professional students can be purchased for a fee of $6. Cost for a non-enrolled student is $12 for students. The university releases only complete academic records.

Registration for Zero Hours (6C1-3.0376(17) Regulations of the University of Florida): The student is assessed the applicable resident or nonresident cost as set forth in Rule 6C1-3.0375, for one credit hour.

Off-campus Educational Activities (6C1-3.3076(19) Regulations of the University of Florida): The president of the University of Florida or the president's designee will establish fees for off-campus course offerings when the location results in specific identifiable increased costs to the university. These fees will be in addition to the regular tuition fees charged to students enrolling in these courses on campus. As used herein, off campus refers to locations other than regular main campus, branch campuses and centers.

Library processing fee: Thesis or dissertation students pay $12.80, to the Library, for the administrative costs of processing the thesis or dissertation, in their final term. Architecture students pay $20.00 for the project option. Thesis and dissertation students are billed this fee through their myUFL account only after making first submission of their thesis or dissertation to the Graduate School Editorial Office. Architecture students should contact their department regarding how this fee will be processed.

Microfilm fee: Dissertation students must pay a $65.00 microfilm fee for publishing and archiving costs to UMI, regardless of their decision to forward their full manuscript for publication to the public through UMI/ProQuest's traditional publication services. This fee will appear and is payable in the student's myUFL account only after making first submission to the Graduate School Editorial Office.

Identification card--Gator 1 Card: The Gator 1 Card is the official University of Florida picture ID card. A valid Gator 1 card must be presented to transact business at University Financial Services; to pick up tickets for athletic events; and to use Gator dining accounts, CIRCA computer labs, University Libraries, and all recreational facilities. The Gator 1 card can be obtained at the UF Bookstore and Welcome Center at the Museum Road entrance. An official picture ID (military ID, passport, or driver's license) and $15 are required. A student's spouse or domestic partner may also obtain a Gator 1 ID, by bringing their official picture ID; their spouse/partner's Gator 1 Card; a copy of their marriage certificate or, in the case of domestic partners, the appropriate affidavit, which can be obtained from Human Resources, by calling (352) 392-0003;

and payment of $15.00. Cash, check, credit or debit cards are accepted.

Please contact Gator 1 Central at 352-392-8343 for additional information.

Payment of Tuition Fees

Tuition fees are payable on the dates listed in the academic calendar. Tuition fee payments are processed by University Financial Services. Checks, cashier's checks, and money orders written in excess of the assessed fees will be processed and the difference refunded at a later date, according to University policy. Checks from foreign countries must be payable through a United States bank in U.S. dollars. The University can refuse two-party checks, altered checks, and checks that will not photocopy.

Electronic check payments, via Electronic Funds Transfer (EFT), can be made online via myUFL without a service charge.

Payments via MasterCard, American Express, or Discover can only be made online via myUFL. A 2.6% service charge will be added to all myUFL credit card payments of tuition, fees, and account receivable charges (laser print, library fines, infirmary, etc.). Payment via Visa credit card is not an option on myUFL, as Visa does not allow this type of service charge. Cash and debit card payments are not payment options.

Returned checks will be charged a service fee of $25 if the returned payment is less than $50; $30 will be charged if the returned payment is $50.01-$299.99 and $40 will be charged if the returned payment is $300 or more.

A $10 service fee will be charged if the bank information provided for the EFT payment is inaccurate for electronic funds transfer.

Returned checks, returned payments and returned service fee EFT payments must be paid by money order or cashier's check.

The University also may impose additional requirements, including advance payment or security deposit.

All financial obligations to the University will be applied on the basis of age of the debt. The oldest debt will be paid first.

All charges noted in this catalog may be subject to change without notice.

Late Registration/Late Payment Fees

Late Registration Fee (6C1-3.037(3) Regulations of the University of Florida): Any student who fails to register prior to the late

registration date published in the academic calendar will be subject to the late registration fee of $100.

Late Payment Fee (6C1-3.037(4) Regulations of the University of Florida): Any student who fails to pay all tuition fees due or to make appropriate arrangements for tuition fee payment (deferment or third party billing) by the tuition fee-payment deadline will be subject to a late payment fee of $100.

Waiver of Late Fees: A student who believes that a late fee should not be assessed because of university error or extraordinary circumstances that prevented all conceivable means of compliance by the deadline may petition for a waiver. Questions relating to the waiving of the late registration fee should be directed to the Office of the University Registrar; while questions relating to the waiving of a late payment fee should be directed to University Financial Services. The university reserves the right to require documentation to substantiate these circumstances.

All charges may be subject to change without notice.

Deferments/Waivers

Deferment of Tuition Fees: Deferment of tuition fees extends the payment deadline for a specific term. A tuition fee deferment is granted based on information from Student Financial Affairs (financial aid deferments) or the Office of the University Registrar (veterans). Refer questions on eligibility to the appropriate office.

A tuition fee deferment is provided to students in the following circumstances:

--Students whose state or federal financial assistance.

--Students receiving veterans or other educational benefits under Chapter 30, Chapter 31, Chapter 32, Chapter 33, Chapter 34, Chapter 35, Chapter 1606 or Chapter 1607 of Title 38 U.S.C., and whose benefits are delayed

--Students for whom formal arrangements have been made with the University for payment by an acceptable third-party donor

--Graduate students with an active Letter of Appointment established by the tuition fee payment deadline for the term in which the deferment is granted

Waiver of Tuition Fees

UF may waive tuition fees as follows:

--Participants in sponsored institutes and programs where the sponsoring agent pays direct costs.

--Intern supervisors for institutions in the State University System may be given one nontransferable certificate (fee waiver) for each full academic term during which the person serves as intern supervisor pursuant to 1009.26(2), Florida Statutes. The certificate is valid for three years from the date of issuance. The maximum hours allowed during a single semester will be six hours of instruction (including credit through continuing education). The certificate will waive the matriculation fee; the student must pay the balance of the fees by the deadline.

--Persons 60 years of age or older are entitled to a waiver of fees for audited courses (up to six credits), as provided by Chapter 1009.26(4), Florida Statutes.

--Certain members of the active Florida National Guard are entitled to a waiver of fees pursuant to Section 250.10(8), Florida Statutes.

--A student enrolled through the Florida Linkage Institutes Program is entitled to a waiver of fees pursuant to Section 288.8175(7), Florida Statutes.

--The non-Florida student financial aid fee may not be waived for students receiving an out-of-state fee waiver.

Deadlines

Deadlines are enforced. The University does not have the authority to waive late payment fees unless extraordinary circumstances warrant such waiver or the University is primarily responsible for the delinquency.

Nonpayment of Tuition Fees (6C1-3.037 Regulations of the University of Florida): The university shall temporarily suspend further academic progress of any student who has not paid the entire balance of his/her tuition fee liability by the established deadlines. This will be accomplished by placing a financial hold on the student's record, which will prevent the student from receiving grades, transcripts and/or diploma, and the student's registration will be denied for future terms until the account has been paid in full.

Students who have not paid any portion of their tuition fee liability by the established university deadline will be assigned withdrawing grades for each course. Students will continue to be held fee liable for these courses, but will not be allowed to attend these courses until arrangements have been made to make payment and the student has been re-registered.

To re-register for courses, students must submit a current Term Re-enrollment Request form to the Registrar's Office with all required signatures and after arrangements for tuition fee payment have been made with University Financial Services. Students who re-register after being withdrawn for nonpayment of tuition fees will be

subject to both late registration and late payment fees.

Refund of Tuition Fees

Tuition fees will be fully refunded in the following circumstances:

--Approved cancellation of enrollment from the university before the end of drop/add, with written documentation from the student

--Credit hours dropped during drop/add

--Courses cancelled by the University

--Call to active military duty

--Death of the student or member of the immediate family (parent, spouse, child, sibling)

--Illness of the student of such severity or duration, as confirmed in writing by a physician, that completion the term is precluded

--Exceptional circumstances, upon approval of the University President or his designee(s)

A refund of 25 percent of the total tuition fees paid (less late fees) is available for withdrawal of enrollment from the university prior to the end of the fourth week of classes for full semesters or a proportionately shorter period of time for the summer terms.

Refunds are issued by University Financial Services and will be applied against any university debts. The university reserves the right to set minimum amounts for which refunds will be produced for overpayments on student accounts.

Tuition refunds due to cancellation, withdrawal or termination of attendance for students receiving financial aid will first be refunded to the appropriate financial aid programs.

If the student is a recipient of federal financial aid (ACG Grant, Grad Plus Loan, Pell Grant, SMART Grant, TEACH Grant, Supplemental Educational Opportunity Grant (SEOG), Perkins Loan, Federal Direct Stafford Loans or PLUS loans), federal rules require that any unearned portion of the federal aid must be returned to the U.S. Department of Education. The amount the student has earned is based on the number of days the student attended classes as compared to the number of days in the entire term (first day of classes to the end of finals week). Any remaining refund then will be returned according to university policy.

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General Fiscal Information

Students can pay the exact amount of tuition fees and/or other amounts owed the university online or at University Financial Services. Our online payment system at myUFL accepts American Express, MasterCard or Discover and electronic funds transfer from checking. Personal checks, cashier's checks and money orders will be accepted at University Financial Services' 24-hour drop box at 113 Criser Hall. 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.

University Financial Services no longer accepts cash or debit card payments and does not cash checks or make cash refunds.

International Students: The university no longer will refund monies in excess of the cost of tuition fees and mandatory health insurance.

It is the student's responsibility to maintain a correct current address in the UF Directory. Address changes should be made online as often as needed.

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Past Due Student Accounts

All students accounts are payable at University Financial Services or on myUFL at the time such charges are incurred. Graduating students with outstanding financial obligations will have a hold placed on their records withholding release of a diploma, transcript, and other university services until the debt is satisfied.

University regulations prohibit the following for any student whose account with the university is delinquent until the debt has been satisfied:

-- Registration
--Release of transcript, diploma, grades and schedules
--Loans
--The use of UF facilities and/or services
--Admission to UF functions and athletic events

Delinquent accounts, including those debts for which the students' records have a financial hold, may require payment by cashier's check or money order.

Delinquent debts may be reported to a credit bureau and can result in placement with a commercial billing service and/or collection agency without further notice, at which time additional collection costs will be assessed in accordance with 6C1-3.0376(20) Regulations of the University of Florida. All payments received are applied to the oldest debt first.

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Graduate Assistantships and Fellowships

Graduate Assistantships are available through individual academic units. Stipend rates paid are determined by the employing academic unit. Interested students should ask their academic-unit offices about the availability of assistantships and the procedure for applying. Early inquiry is essential to be assured of meeting application deadlines. Appointments are made on the recommendation of the academic unit chair, subject to admission to the Graduate School and to the approval of the Dean of the Graduate School. Initial appointment requires clear evidence of

superior ability and promise. Reappointment to assistantships requires evidence of continued good scholarship.

Apply to the appropriate academic unit chair, on or before February 15th of each year, unless otherwise specified.

Fellows, trainees, and graduate assistants must pay appropriate tuition and fees. Fellows receiving stipends of $4,000 or greater per term (prorated for summer) are expected to devote full time to their studies. Students who accept fellowships and traineeship are required to register appropriately. Trainees are also expected to devote full time to their studies. Graduate assistants have part-time teaching or research duties; they are required to register for reduced study loads, according to the schedule for their appointment. Students on appointment are financially liable for excess credits beyond the required registrations. **If a student on appointment drops below the required registration at any time in the semester, the student becomes financially liable for the entire registration.**

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Graduate School Fellowship Program

http://www.aa.ufl.edu/fellows/alumni.html

The Graduate School Fellowship program (GSF) represents the most prestigious graduate student award available at the University. Funded at nationally competitive levels, these highly desirable awards support students in all programs and departments of the University awarding a Ph.D. or MFA.

To ensure that Graduate School Fellows receive every opportunity to succeed, the GSF will provide at least a full four years of support through a nationally competitive stipend and tuition waiver for qualifying students in PhD programs. The awards are for at least two years for students in MFA programs. Most Graduate School Fellows will receive both research and teaching assignments.

The University expects Graduate School Fellows to demonstrate high standards of academic achievement and active participation in university life. Applicants for the GSF apply through the departments or programs of their major field of study. Successful applicants will have outstanding undergraduate preparation, a strong commitment to their field of study, and demonstrated potential in research and creative activities. For more information on the fellowships available, please contact the graduate coordinator for the degree program of interest.

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Grinter Fellowship

Named in honor of Dr. Linton E. Grinter, Dean of the Graduate School from 1952 to 1969, this fellowship helps recruit truly exceptional graduate students. Currently enrolled graduate students are not eligible, except when entering a Ph.D. (or other terminal degree) program. Stipends are normally $2000 to $4000. Continuing the Grinter Fellowship beyond the first year depends on satisfactory student progress. Students in the Colleges of Engineering and Law are not eligible. For information, visit http://www.aa.ufl.edu/fellows/grinter.html.

For details, contact the appropriate major academic unit.

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Title VI: Foreign Language and Area Studies Fellowship

Title VI fellowships are available to graduate students whose academic programs are Latin America, Africa, or Europe oriented.

Applicants must be U.S. citizens or permanent residents and must be registered for a full-time course load including a language relevant to the area of their choice: specifically, Portuguese or Haitian Creole for recipients through the Center for Latin American Studies; Akan, Amharic, Arabic, Swahili, Wolof, Xhosa, Yoruba, or other African languages for which appropriate instruction can be arranged, for recipients through the Center for African Studies; and Czech, Greek (modern), Hungarian, Italian, Polish, Portuguese, Russian, Turkish, or other lesser and least commonly taught European languages for which appropriate instruction can be arranged for recipients through the Center for European Studies. The fellowships provide a $15,000 stipend for the academic year and $2,500 for the summer plus payment of all tuition and fees. Academic year and summer fellowship programs have separate application processes.

For more information, contact:

Center for Latin American Studies
(319 Grinter Hall, http://www.latam.ufl.edu);

Center for African Studies
(427 Grinter Hall, http://www.africa.ufl.edu); or

Center for European Studies
(3324 Turlington Hall, http://www.ces.ufl.edu).

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Veterans Administration and Social Security Administration Benefits Information

Veterans Benefits

UF Office of Veterans Affairs

The University of Florida is approved by the Florida Department of Veterans Affairs (VA) to educate and train veterans or their eligible spouses or dependents.

Ten federal public laws currently provide education/job-training programs for VA-eligible students. Six programs serve most students:

—Chapter 30 for U.S. Military Veterans

—Chapter 31 for Disabled U.S. Military Veterans

—Chapter 33 (Post 9/11 GI Bill) provides financial support for education and housing to individuals with at least 90 days of aggregate service on or after September 11, 2001, or to individuals discharged with a service-connected disability after 30 days. Service members enrolled in the Post 9/11 GI Bill program may also transfer unused educational benefits to their spouses or children.

—Chapter 35 for Spouse and Children of Deceased or 100 percent (permanent and totally) Disabled Veterans (service connected)

—Chapter 1606 for personnel in the National Guard or U.S. Military Reserves.

—Chapter 1607 for personnel in the National Guard or U.S. Military Reserves called or ordered to active duty in response to a war or national emergency (contingency operation) as declared by the President or Congress. Members may be eligible after serving 90 consecutive days on active duty after September 11, 2001.

—Chapter 30, 1606 and 1607 program participants are required to verify attendance each month to the federal VA. Verification can be done online on the Web Automated Verification of Enrollment (WAVE) page or veterans can call 1-877-823-2378.

Students are required to meet the minimum cumulative UF grade point average for their specific academic program; i.e., 2.00 for undergraduate/professional degrees and 3.00 for graduate degrees. The first term a student falls below minimum standards a warning will be sent. If at the end of the next term of enrollment a student is below minimum standards, the student's educational benefits will be terminated and the DVA will be notified of the student's unsatisfactory progress for VA pay purposes. Students must meet the conditions for UF readmission to become eligible again for VA educational programs.

UF's Office of Veterans Affairs in 222 Criser Hall coordinates veterans services and specific program information. Eligible students

must submit an Application for Educational Benefits and request certification for full-time or part-time educational benefits in accordance with VA rules and regulations.

This office also can provide confirmation of student status for VA health care or other benefits. Additionally, the University of Florida provides military training to college credit evaluation and encourages all veterans to request this service from the campus Veterans Advocate.

A full-time fall and spring semester undergraduate load for VA benefits is 12 credit hours per semester; a full-time fall and spring semester graduate load is nine hours. Summer terms full and part-time enrollment requirements differ. Students should refer to the UF VA website for specific information about summer credit requirements.

The Atlanta Regional Processing Office of the U.S. Department of Veterans Affairs determines eligibility based on official service records, evidence submitted by the student and applicable laws. Students with established VA program eligibility at another college or university must submit a Change of Program or Place of Training and a UF enrollment verification request to 222 Criser Hall.

For more information about VA educational benefits please visit www.gibill.va.gov/.

Social Security Benefits

Inquiries related to Social Security benefits should be directed to the student's local Social Security Office. The Office of the University Registrar will complete enrollment certificates issued by the Social Security Administration for students eligible to receive educational benefits. A full-time graduate load is nine hours.

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External Fellowships for Graduate Students

Information on external fellowships, small grants, and other funding opportunities is available on the Office of Research website: http://research.ufl.edu/research/funding.html. The Community of Science Funding Opportunities database and the GrantsNet Database are keyword searchable and highly recommended as information resources. The University Libraries hosts a website: http://www.uflib.ufl.edu/funding/.

The Graduate School posts information that it receives concerning external funding opportunities at https://gradschool.ufl.edu/students/financial-aid-bulletin-board.html.

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Graduate Minority Program Assistance and Fellowships

The following fellowships and programs are administered by the Graduate School's Office of Graduate Minority Programs (OGMP) (http://gradschool.ufl.edu/diversity/introduction.html):

Florida Board of Education (BOE) Summer Program: BOE is held during Summer B and is an orientation and preparation program for ethnic/cultural minorities, first-generation students and students who are underrepresented in various academic disciplines. This program prepares newly admitted students for the demands of graduate education (research, writing, time management, etc.). Participants receive a $1,500 stipend and payment of 4 credits for Summer B. All participants must be registered as full-time students for the next academic year. Preference will be given to newly admitted PhD students. U.S. citizens and permanent residents who meet criteria for eligibility and who have been admitted to a UF graduate program are invited to apply online at http://gradschool.ufl.edu/diversity/boe-summer.html
Application deadline: May 30.

Florida A & M University (FAMU) Feeder Program: UF is 1 of 47 universities in the FAMU Feeder program aimed at increasing the number of FAMU students in graduate programs. FAMU nominates students with at least a 3.0 GPA to participating feeder institutions for admission into their graduate programs. OGMP is UF's main contact for the feeder program. UF offers five fellowships every year to qualified FAMU Feeder students who have been admitted to a Ph.D. or an M.F.A. program. Each fellow receives an $8,000 annual stipend, tuition and health insurance for up to three years.
For information please visit
http://gradschool.ufl.edu/diversity/famu-feeder.html.
Application deadline: April 1.

McKnight Doctoral Fellowship: The Florida Education Fund (FEF) awards McKnight Doctoral Fellowships to African American and Hispanic students newly admitted into selected Ph.D. programs at institutions in Florida. The Fellowship provides a $12,000 annual stipend, tuition, fees, and health insurance for up to 5 years, provided there is satisfactory progress toward completing the degree. African Americans and Hispanics who are U.S. citizens are eligible to apply for the McKnight Doctoral Fellowship and should contact FEF for applications and more information:

201 East Kennedy Blvd.
Suite 1525
Tampa, FL 33602
Phone (813) 272-2772 or
Visit their website: http://www.fefonline.org/mdf.html
Application deadline: January 15.

University of Florida/Santa Fe College Faculty Development Project: This partnership initiative allows UF doctoral students to teach as adjunct professors at Santa Fe College. Participants must teach 3 courses per year at SFC and help SFC recruit and retain minority students. The program provides a $9,000 stipend for 9 months, 12 credits of tuition, fees and health insurance for fall and spring semesters for up to 4 years. Faculty Development Project applicants must be U.S. citizens from a minority or underrepresented group and hold a master's degree in one of the approved disciplines. For additional information, please visit http://gradschool.ufl.edu/diversity/uf-sfcc-development.html Application deadline: April 15

National Consortium for Graduate Degrees for Minorities in Engineering and Sciences, Inc. (GEM) Fellowship: This fellowship program supports African American, Native American, and Hispanic students in pursuing the Master of Science degree in engineering and the Doctor of Philosophy degree in engineering and science disciplines. The GEM Consortium pays both master's and doctoral fellowship recipients' tuition, fees, and a stipend. The Practical Summer Internship component brings the fellowship total value to between $20,000 and $60,000 for master's students and $60,000 and $100,000 for doctoral students. Each M.S. applicant must be a junior, senior, or graduate of an engineering program with at least a 2.8 GPA. Each Ph.D. applicant must be a junior, senior, or graduate of an engineering program with at least a 3.0 GPA. For more information about GEM Fellowship Programs, visit http://www.gemfellowship.org, or call (574) 631-7771.

Supplemental Retention Award: This award assists doctoral students in completing their degrees by providing tuition support and involving them in a structured program. Students within 3 semesters of completing their Ph.D. or M.F.A. degree, who no longer have funding available through an assistantship or fellowship, are eligible to receive limited tuition assistance for the remaining semesters. The tuition assistance is not given in the form of cash, employment, tuition, or fee waiver; it is paid directly to Student Financial Services. This award is limited to U.S. citizens or permanent-residents. Applications may be obtained at http://gradschool.ufl.edu/diversity/supplemental-retention.html

Delores Auzenne Dissertation Award: The Delores Auzenne Dissertation Award is a competitively awarded program, available to underrepresented Ph.D. students in the advanced writing stages of their dissertation. Applicants may not receive a fellowship, assistantship, or other funding with this award. The award provides one semester of support, which includes tuition assistance of up to 3 hours of dissertation credits, and a $6,500 stipend.

Recipients may only qualify for the award for one semester. The application deadline is in mid-April. Awards are normally made for the summer and fall semesters. Students must adhere to the

following application guidelines to qualify for full consideration: Awardees will be expected to participate in at least 2 Professional Development Programs organized by the Office of Graduate Minority Programs, and provide regular updates of their writing progress. For more information visit http://gradschool.ufl.edu/diversity/auzenne-award.html Application deadline: April 1.

Ronald E. McNair Graduate Assistantship Program: UF provides a limited number of 1-year research assistantships for McNair scholars who are entering a Ph.D. program at this institution. It provides a stipend ($12,000), full tuition, fees, and health insurance for only the first year of the Ph.D. It assists students who have successfully completed the McNair Post-Baccalaureate Achievement Program as undergraduates. It is open to all McNair Scholars in good standing. The student will be appointed and perform research assistant duties under faculty supervision. Since this program is intended to increase enrollment in PhD programs, currently enrolled doctoral students are not eligible. Interested students who meet the eligibility requirements are invited to apply. The application form can be found at http://gradschool.ufl.edu/diversity/mcnair-assistantships.html. Application deadline: April 1.

AC-SBES Alliance: The University of Florida is a participant in the Atlantic Coast--Social, Behavioral and Economic Sciences Alliance (AC--SBES) grant, which is funded by the National Science Foundation. The Alliance seeks to increase the number of underrepresented minority (URM) students receiving Ph.D. degrees in SBES disciplines and to increase the number of URMs entering the SBE professoriate. Through the Alliance, UF works collaboratively with Howard University, the University of Maryland at College Park, the University of Miami, and the University of North Carolina at Chapel Hill to broaden participation of URM doctoral students in SBE doctoral programs. The AC--SBES Alliance provides a limited number of stipends to incoming doctoral students, research stipends for AC--SBES scholars, summer bridging and retention programs, and travel awards for AC-SBES scholars. Stipends are competitively awarded based on recommendations by the academic units involved. For more information please visit the website: http://gradschool.ufl.edu/grants/sbe/introduction.html .

Bridge to the Doctorate Fellowship: The Bridge to the Doctorate (BD) Grant was awarded to UF by the National Science Foundation through the Florida-Georgia Louis Stokes Alliance for Minority Participation (FG-LSAMP) to enhance recruitment and retention of underrepresented minority students in Science, Technology, Engineering and Mathematics (STEM) disciplines. The BD provides $30,000 per year for the first two years of doctoral studies for former LSAMP students who are entering Ph.D. programs after completing baccalaureate degrees. In addition, the grant provides funds for the same two years for each BD student's cost of

education (tuition, fees and health insurance). The grants are awarded to institutions in two-year cycles. The current class of BD students at UF entered in fall 2010 and will remain on the grant for two full years.

Campus Visitation Program (CVP): This program invites prospective students who are underrepresented in graduate studies to visit the University of Florida campus. During the visitation, participants learn more about UF's graduate programs and meet with administrators, faculty members, and current graduate students. CVP is held for 2 days during fall and spring semesters. OGMP provides housing and some meals, and participants are reimbursed for part of their travel expenses. Students must meet the minimum UF requirements of an undergraduate GPA (3.0) and must have taken the graduate entrance examination (GRE, GMAT, etc.) to be considered for acceptance into the visitation program. Program applicants must be U.S. citizens or permanent-residents. Applications can be obtained at http://gradschool.ufl.edu/diversity/cvp.html.
Application deadlines usually fall in late September and mid-January of each year.

Professional Development Workshops: During the academic year, the Office of Graduate Minority Programs plans multiple professional development workshops on topics related to graduate and professional success (getting your work published, financial management, choosing a mentor, etc.). These workshops are free and open to all UF students. For dates go to the OGMP website: http://gradschool.ufl.edu/diversity/professional-development.html.

Please note: The UF Office of Graduate Minority Programs is not involved in processing applications or making admissions decisions. The student's academic unit is the primary contact for both. For questions about the online application process, please contact the UF Office of Admissions directly through the "Contact Us" link at the bottom of that webpage.

For additional information you may contact the OGMP office at

115 Grinter
P.O. Box 115500
Gainesville, FL 32611

Phone
(352) 392-6444, (800)753-9798

E-mail
ogmp@ufl.edu

Visit online at http://gradschool.ufl.edu/diversity/introduction.html.

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Office for Student Financial Affairs

Financial aid is available to qualified graduate students through the Office for Student Financial Affairs (SFA) in S107 Criser Hall, mainly through work or loan programs.

Applying for financial aid at UF, including loans, begins with the FAFSA, the Free Application for Federal Student Aid. Apply on or soon after January 1. Students should not forget to reapply each year. Financial aid is not renewed automatically.

Although you must be accepted for enrollment at UF before you receive financial aid, you should apply for aid before being admitted.

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Loans

UF primarily offers student loans through the Federal Direct Loan Program, but there are a number of other loan programs available at UF, including: UF Long Term Loans, UF Short Term Loans, and Alternative Loans. These programs offer long-term, low-interest loans. Your eligibility will be determined based on your classification, cost of attendance, and a number of other factors.

Short-term loans: UF has an emergency short-term loan program to help students meet temporary financial needs related to educational expenses. Graduate students may borrow up to $1,000 or the amount of in-state tuition if they have an acceptable repayment source. Interest is 1% per month and these loans must be repaid by the first day of the last month in the term the money is borrowed. Processing takes about 48 hours. For applications, visit SFA in S107 Criser Hall.

For more information regarding specific loan programs, please visit SFA's loan page at http://www.sfa.ufl.edu/programs/loans.

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Part-Time Employment

UF offers part-time student jobs through three employment programs: Federal Work-Study jobs, including the Federal Community Service component; Other Personnel Services (OPS); and off-campus jobs.

Federal Work-Study jobs are based on financial need. To apply for Federal Work-Study jobs, students must complete a FAFSA. OPS jobs are not based on financial need. All on-campus job openings

are listed at http://jobs.ufl.edu.

For more information on jobs and how to apply, go to http://www.sfa.ufl.edu/programs/employment.

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Academic Progress Policy for Financial Aid Recipients

Students receiving financial aid must be in good standing at UF and maintain financial aid satisfactory academic progress requirements. UF's financial aid academic progress requirements are available on the Office for Student Financial Affairs (SFA) website at http://www.sfa.ufl.edu, in SFA's Gator Aid Handbook, in the brochure that accompanies all financial aid award letters issued by SFA, and as a handout at the SFA service counters in S107 Criser Hall.

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Libraries

The Libraries of the University of Florida (UF Libraries) form the largest information resource system in the state of Florida. While the collections are extensive, they are not comprehensive and graduate students supplement them with a variety of services and cooperative programs drawing on the resources of many other libraries.

The UF Libraries comprise nine libraries: Eight are in the system known as the George A. Smathers Libraries of the University of Florida, and one (Legal Information Center) is attached to the law school's administrative unit. All of the libraries serve all the University's faculty and students, but each has a special mission to

be the primary support of specific colleges and degree programs. Because of the interdisciplinary nature of research, scholars may find collections built in one library to serve a specific discipline or constituency to be of great importance to their own research in another discipline. Usually, more than one library is needed to discover all the resources that pertain to a particular research interest. The University of Florida Gator 1 card gives students and faculty access to library services. This card is used to circulate books, to borrow reserves, and to establish identity for other library services such as Interlibrary Loan and remote access to databases.

The library home page, http://www.uflib.ufl.edu, offers a wealth of information about the Libraries and links to a vast array of resources. The Libraries are integrating electronic collections and services, and are digitizing materials from our Florida and other unique collections. Indexes, abstracts, and other reference resources (including over a thousand specialized databases) are increasingly available. From the home page it is possible to connect to the full text of articles in more than 158,695 full-text electronic journals and thousands of books, documents, maps, and manuscripts.

The library home page has a link to the library catalog that contains records for all UF collections in all formats (except for some special archival, map, and document collections that must be accessed through catalogs and finding aids at the collection location). It connects to library books currently on course reserve and provides links to a growing number of books, journals, and newspapers that are available in electronic form. The Subject Guides and Specialists page provides guides to subject literature and links to key resources and pertinent websites as well as the name of the library subject specialist. The library home page provides links to the pages of individual campus libraries, lists library training opportunities, and provides a great deal of information on services and policies. It enables students to link to the libraries' Ask a Librarian IM chat reference service, and to electronic forms for making suggestions, renewing materials, initiating interlibrary loan requests, and recalling materials charged to other borrowers.

Workstations in UF libraries provide access to this whole array of electronic resources and services. Most library databases, e-jhournals and e-books are purchased from publishers or services that restrict access to authorized users by detecting the IP address of any computer attempting to connect. Campus computers are allowed access automatically. As members of the UF academic community, you may connect to these resources from home or abroad. To do so, connect to the library using Off-Campus Access from the libraries' home page. Log in using your Gatorlink username and password, or download the VPN for a more secure and stable connection. More information is available at http://www.uflib.ufl.edu/ufproxy.html.

Because of the disciplinary variation in research methods, the policies enforced and the services offered may differ from library to library. Most of the libraries have an advisory board consisting of faculty and students who advise on the policies and services relating to their library. Information on local policies is available at the information desks in each library and on the specific library's home page. As is common in research libraries, library materials are housed in a variety of locations depending on discipline.

Library West houses most of the humanities and social science collections, and professional collections in support of business, health and human performance, and journalism are normally housed in this building. The African Studies and Asian Studies collections are located in Library West. The Isser and Rae Price Library of Judaica is located on the first floor. Library West includes 84 individual graduate study carrels that are assigned for the academic year. An online application form is available from the library home page. In addition, the sixth floor of Library West is a study area reserved for graduate students. Access is provided after students register at the Circulation Desk.

Smathers Library (formerly known as Library East) holds the Latin American Collection and the Special Collections: rare books and manuscripts, The Baldwin Library of Historical Children's Literature, P. K. Yonge Library of Florida History and University Archives (custodian of the University's historically significant public records including the administrative files of its past presidents).

Marston Science Library, named for Robert Q. Marston, the seventh president of the University of Florida, houses collections in agriculture, life sciences, engineering, physical sciences, mathematics and earth sciences. The building is also home to the Map Library and Imagery Library and the Documents Department, which is a regional depository for U.S. federal government publications as well as a collection of Florida international and planning documents.

Architecture / Fine Arts Library (201 Fine Arts Building A) holds visual arts, art history, architecture, landscape architecture, interior design, building construction and urban planning materials.

Business Library (http://www.uflib.ufl.edu/businesslibrary/) is both an Internet portal to online business information databases and a physical collection housed and serviced in Library West. The Virtual Business Library provides instant access to high quality business information--anytime, anywhere in the world. There are more than 100 business, economics, accounting, and tax research databases as well as subject guides, step-by-step tutorials, case studies illustrating business research and journal collections. The contents of the Business Library include thousands of journal subscriptions, full-text articles from all of the leading business publications, reports on publicly traded corporations around the world, investment

research from the leading Wall Street firms, daily country intelligence on all the nations of the world, a fully integrated tax research library, U.S. and international marketing research, multiple sources for company and industry information, access to millions of downloadable data series, market share data, business rankings, economic reports, electronic books and much more.

Education Library (1500 Norman Hall) holds education, child development, higher education, psychology, and counseling collections. In addition to electronic and print research materials, there are other specialized collections such as the Children's Literature Collection, the K-12 Textbook Collection, and the ERIC Documents Microfiche and other multimedia collections.

Music Library (231 Music Building) houses music scores, books, periodicals and other music sources, as well as a non-circulating collection of recordings.

Allen H. Neuharth Journalism and Communications Library (1060 Weimer Hall) contains a collection of books, newsletters, scholarly journals, trade publications, magazines and newspapers that support the instructional and research needs of the College of Journalism including the Departments of Advertising, Journalism, Public Relations and Telecommunication.

UF Digital Collections comprise a constantly growing collection of digital resources from the University of Florida's library collections, as well as partner institutions.

Health Science Center Libraries serve the academic, research and clinical information needs of the Colleges of Dentistry, Medicine, Nursing, Pharmacy, Public Health and Health Professions and Veterinary Medicine. The Borland Library (2nd floor, Learning Resource Center) is the Jacksonville branch, and the Veterinary Medicine Reading Room is located in room V1-110 in the College of Veterinary Medicine Building.

Lawton Chiles Legal Information Center holds resources for law and related social sciences with over 595,000 volumes and equivalents. It is named in honor of the former governor and senator and housed in a completely renovated facility that is the largest in the Southeast. The Lawton Chiles Legal Information Center occupies the bottom three floors of Holland Hall with computer support on the top floor. The facility includes 13 student study rooms, a lactation/meditation room, lounge seating, open reserve area and carrels.

Together the Libraries hold over 45.6 cataloged volumes, 7.9 million microfilms, 453,000 e-books, 158,695 full-text electronic journals and 1,162 electronic databases. The Libraries have built a number of nationally significant research collections mainly supporting graduate research programs. Among them are the Baldwin Library of

Children's Literature, which is among the world's greatest collections of literature for children (Special Collections, Smathers Library); the Map and Imagery Library, which is an extensive repository of maps, atlases, aerial photographs, and remote sensing imagery with particular collection strengths for the southeastern United States, Florida, Latin America, and Africa south of the Sahara (Marston Science Library, Level One); the Isser and Ray Price Library of Judaica, which is the largest collection of its kind in the Southeast (Library West); and the P.K. Yonge Library of Florida History, which is the state's preeminent Floridiana collection and holds the largest North American collection of Spanish colonial documents about the southeastern United States and rich archives of prominent Florida politicians (Special Collections, Smathers Library).

The Libraries also have particularly strong holdings in architectural preservation and 18th-century American architecture (Architecture and Fine Arts), late 19th- and early-20th-century German state documents (Library West), Latin American art and architecture (Architecture and Fine Arts and Smathers Library), national bibliographies (Humanities & Social Science Reference, Library West), U.S. Census information, especially in electronic format, and other U.S. documents (Documents Department, Marston Science Library), the rural sociology of Florida and tropical and subtropical agriculture collections (Marston Science Library), and English and American literature (Library West).

Reference service is provided to library users in each library and is also available via phone, e-mail and interactive chat. All of the libraries provide special services to help students and faculty with disabilities in their use of the libraries; information is available at all circulation desks. At the start of each term, the Libraries offer orientation programs to explain available services and how to use them. Schedules are posted in each library at the start of each term and in the training session part of the library webpage (http://www.uflib.ufl.edu/jgs/instruct.html). Individual help is available at the reference desk in each library. In addition, instructional librarians will work with faculty and teaching assistants to develop and present course-specific library instruction sessions. Instruction coordinators are available in Humanities and Social Science Reference in Library West, in Marston Science Library and in the branches.

Subject specialists, who work closely with faculty and graduate students to select materials for the collections, also advise graduate students and other researchers who need specialized bibliographic knowledge to define local and global information resources available to support specific research. Consult the subject specialists when starting work on a large research project or developing a working knowledge of another discipline. A list of subject specialists is available at information desks and via http://apps.uflib.ufl.edu/staffdir/SubjectSpecialist.aspx. Users may schedule a meeting with the appropriate specialist.

The Libraries' memberships in the **Research Libraries Group** and the **Center for Research Libraries** give faculty and students access to many major scholarly collections. The Libraries also are linked to major national and international databases. Many materials not held on campus can be quickly located and borrowed through one of the cooperative programs to which the Libraries belong. Consult with a reference librarian to take advantage of these services. Publications describing specialized services are available at reference and circulation desks throughout the Libraries.

For information on library hours:
http://www.uflib.ufl.edu/ps/hours or call the desired library.

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Computer Facilities

Computing and Networking Services (CNS)

Computing and Networking Services, formerly the Northeast Regional Data Center (NERDC), is a unit of the UF Office of Information Technology. CNS's facilities are used for instructional, administrative, and research computing, and are in the Bryant Space Sciences Research Building (SSRB). For more information, visit the CNS home page http://www.cns.ufl.edu.

Office of Academic Technology (AT) at the Hub

Services available to graduate students include electronic thesis and dissertation computing support; phone and walk-in desktop applications and technical consulting; GatorLink mail; web and dialup services; UNIX® and Computing and Networking Services (CNS) computing accounts; software distribution; and the use of computer classrooms, multimedia and video equipment, and laboratories; and programming languages and packages for mathematical and statistical analysis. The AT/CIRCA computer classrooms are available for personal and academic use. They are equipped with IBM-compatible and Macintosh-compatible computers, laser printers, plotters, and scanners. CIRCA computer facilities offer students applications for word processing, spreadsheets, data analysis, graphics, and the Internet.

Instructors may use the site-licensed WebCT Vista course management system to provide online course tools such as syllabus, content and secure grade posting. Instructors whose courses require UNIX® or IBM mainframe computing may also apply for class computing accounts. Applications for these instructional accounts are available at the Help Desk in 132 Hub. Instructors may reserve CIRCA computer classrooms or multimedia lecture classrooms for class sessions. For more information about these and other Academic Technology services, contact the UF Computing Help

Desk, 132 Hub, http://helpdesk.ufl.edu, (352) 392-HELP, or see the Academic Technology website at http://at.ufl.edu.

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Art Galleries

The 86,800-square-foot **Samuel P. Harn Museum of Art** in the University of Florida Cultural Plaza is one of the Southeast's largest university art museums and the only art museum in North Central Florida accredited by the American Association of Museums. Admission is free. The Harn's five collection galleries focus on African, Asian, modern, and contemporary art and photography. Diverse temporary exhibitions are also presented. Performances, family programs, lectures and films increase art appreciation. Museum hours are 11 a.m. to 5 p.m. Tuesday through Friday; 10 a.m. to 5 p.m. Saturday; 1 to 5 p.m. Sunday; select Thursdays 5 to 9 p.m. for Museum Nights. Free docent-led tours Saturday and Sunday at 2 p.m.

The University Gallery, established in 1965, is an essential component of the teaching, research, and service missions of the School of Art and Art History. The Gallery's primary purpose is to present high-quality visual-arts exhibitions that reach a diverse cross section of the University's many academic disciplines and core research areas and to provide rich first-hand interaction with cutting-edge artwork for art students and faculty to foster learning in art.

Focus Gallery (in the lobby of the School of Art and Art History offices in the Fine Arts Complex) was established in 1963. Public exhibition space is used by students and faculty sponsors in the School of Art and Art History to experiment with artwork and experience the production of art exhibitions.

Grinter Galleries (in the lobby of Grinter Hall) was established in 1972. This venue is reserved for exhibitions of international art and artifacts that teach about world culture. Many of the University's international centers are located in Grinter Hall, and their programs provide content for the galleries' exhibitions.

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Performing Arts

University of Florida Performing Arts brings a diverse range of events to its venues each season, including theatre, chamber, classical, dance, family, jazz, opera, pops, film, and world music/dance. The 1,700-seat **Curtis M. Phillips Center for the Performing Arts** features computerized lighting and sound systems. Its Black Box Theatre is used for experimental or small musical productions, recitals, and receptions. The historic University Auditorium seats 867 and provides a classic setting for chamber and

solo concerts, lectures, and more. The Baughman Center, a breathtaking pavilion on the shores of Lake Alice, is an inspirational setting for both contemplation and celebration.

For information about UFPA:
Administrative offices,
Phone (352) 392-1900.

For event information or tickets:
Phillips Center Box Office,
Phone (352) 392-ARTS ext.2787,
Website http://www.performingarts.ufl.edu.

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Florida Museum of Natural History

The Florida Museum of Natural History was created by the Legislature in 1917 as a department of the University of Florida. Through its affiliation with the University, it carries dual responsibility as the official State Museum of Florida and as the University museum. The public education and exhibits division of the Museum is in Powell Hall, on Hull Road at the western edge of campus, situated between the Harn Museum of Art and the Center for the Performing Arts. Powell Hall is devoted exclusively to permanent and traveling exhibits, educational and public programs, special events, and includes the Butterfly Rainforest. It is staffed by specialists in interpreting natural history through exhibits and educational programs. Consult the website for hours and admission fees (http://www.flmnh.ufl.edu). The Museum also operates as a center of research in anthropology and natural science. The research and collections division is in Dickinson Hall, at the corner of Museum Road and Newell Drive. This building is not open to the public. The Department of Natural History houses the state's natural history collections and is staffed by scientists and support personnel concerned with the study of modern and fossil plants and animals, and historic and prehistoric people and their cultures; scientific and educational faculty (curators) hold appointments in appropriate UF academic units. Through these appointments, they participate in both undergraduate and graduate teaching programs. The Museum's newest addition is the McGuire Center for Lepidoptera and Biodiversity. This world-class facility features a 46,000-square-foot Lepidoptera center devoted to housing one of the world's largest and most comprehensive Lepidoptera collections, and state-of-the-art research facilities for their study. It also contains dynamic public exhibitions and a live Butterfly Rainforest with a walking trail, educational exhibits, and hundreds of living butterflies.

The **Randell Research Center** at the Pineland archeological site near Fort Myers, Florida, is dedicated to learning and teaching the archeology, history, and ecology of Southwest Florida.

The **Herbarium at UF** is also a division of the Museum. It contains over 255,000 specimens of vascular plants and 170,000 specimens of nonvascular plants. The research collections are in the care of curators who encourage scientific study of the Museum's holdings. Materials are constantly being added to the collections both through gifts from friends and as a result of research activities of the Museum staff. The archaeological and ethnographic collections are noteworthy, particularly in the aboriginal and Spanish colonial material remains from the southeastern United States and the Caribbean. There are extensive study collections of birds, mammals, mollusks, reptiles, amphibians, fish, invertebrate and vertebrate fossils, and plant fossils, and a bioacoustic archive consisting of original recordings of animal sounds. Opportunities are provided for students, staff, and visiting scientists to use the collections. Research and field work are presently sponsored in the archaeological, paleontological, and zoological fields.

Students interested in these specialties should apply to the appropriate academic units. Graduate assistantships are available in the Museum in areas emphasized in its research programs.

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Agricultural Experiment Station

The Florida Agricultural Experiment Station conducts statewide research programs in food, agriculture, natural resources, and the environment. Research deals with agricultural production, processing, marketing, human nutrition, veterinary medicine, renewable natural resources, and environmental issues. This research program includes activities by departments on the Gainesville campus and on the campuses of Research and Education Centers throughout the state. Close cooperation with numerous Florida agricultural and natural resource related agencies and organizations is maintained to provide research support for 280 agricultural commodities and Florida's rich natural resources.

The land-grant philosophy of research, extension, and teaching is strongly supported and administered by the Vice President for Agriculture and Natural Resources. The Institute of Food and Agricultural Sciences, under his leadership, comprises the Florida Agricultural Experiment Station, the Florida Cooperative Extension Service, the College of Agricultural and Life Sciences, and elements of the College of Veterinary Medicine, each functioning under a dean. Most IFAS faculty have joint appointments involving teaching, research, and/or extension. Funds for graduate assistants are made available to encourage graduate education and professional scientific improvement.

Research and graduate programs are conducted in 16 departments and two schools: Agricultural and Biological Engineering; Agricultural Education and Communication; Agronomy; Animal Sciences;

Entomology and Nematology; Environmental Horticulture; Food and Resource Economics; Food Science and Human Nutrition; Fisheries and Aquatic Sciences; Family, Youth and Community Sciences; Horticultural Sciences; Microbiology and Cell Science; Plant Pathology; Soil and Water Science; Statistics; Veterinary Medicine; Wildlife Ecology and Conservation; the School of Forest Resources and Conservation; and the School of Natural Resources and Environment. Additional support units vital to research programs include Educational Media and Services, Facilities Planning and Operations, Planning and Business Affairs, Sponsored Programs, IFAS International Programs, Personnel, and Governmental Relations.

Outside of Gainesville, IFAS faculty and graduate students are located at 13 Research and Education Centers throughout Florida, from Homestead in the extreme south, to Jay in the extreme west. Extension personnel are located in all of Florida's 67 counties.

The Florida Agricultural Experiment Station cooperates with the Brooksville Subtropical Research Station, Brooksville (a USDA field laboratory) in its beef cattle and pasture production and management programs; and with the National Weather Service, Ruskin, in the agricultural weather service for Florida.

Additional research is conducted through the Center for Natural Resources Programs; the Center for Environmental Toxicology; the Center for Aquatic and Invasive Plants; the Ordway-Swisher Biological Station; the Center for Tropical Agriculture, portions of the College of Veterinary Medicine; the Florida Sea Grant Program; and the International Program for Food, Agriculture and Natural Resources. A Center for Cooperative Agricultural Programs (CCAP) in Tallahassee is jointly supported with Florida A & M University.

Ordway-Swisher Biological Station. The Ordway-Swisher Biological Station (http://www.ordway-swisher.ufl.edu) is a year-round biological field station established for the long-term study and conservation of unique ecosystems through research, teaching, and management. It is managed for the University of Florida by the UF/IFAS Department of Wildlife Ecology and Conservation. The 9300-acre property is located in Putnam County, Florida (roughly 26 miles from Gainesville) and is not open to the general public. The property is a mosaic of wetlands and uplands that include sandhills, xeric hammock, upland mixed forest, swamps, marshes, clastic upland lakes, sandhill upland lakes, and marsh lakes. A variety of fauna inhabit the preserve, including a number of state and federally listed species. Wildfires and prescribed burning have had a strong influence on the landscape. The Preserve is a member of the Organization of Biological Field Stations (OBFS).

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Engineering and Industrial Experiment Station

The internationally recognized Engineering and Industrial Experiment Station (EIES) is the research arm of the College of Engineering. It was officially established in 1941 by the Florida Legislature. Its primary purpose is to perform research that benefits the state's industries, health, welfare, and public services. The EIES also works to enhance our nation's global competitive posture by developing new materials, devices, and processes. The EIES provides significant opportunities for undergraduate and graduate engineering students to participate in hands-on, cutting-edge research.

The EIES addresses a wide variety of state and national research issues through the college's academic departments and engineering research centers. It takes an interdisciplinary approach to research by involving talents from diverse areas of the College and the University. Particle science and technology, nanoscience and technology, materials, intelligent machines, transportation, biomedical engineering, computer technologies and systems, communications, information systems, energy systems, robotics, construction and manufacturing technologies, computer-aided design, process systems, a broad spectrum of research related to the "public sector" (agricultural, civil, coastal, and environmental) represent some of the EIES broad-based research programs.

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UF Electronic Delivery of Graduate Engineering (UF EDGE)

UF EDGE offers online graduate engineering master's degrees, courses and certificates from the College of Engineering. The UF EDGE program allows engineers to obtain their master's degrees from any location without the need to travel to the UF campus. All course lectures and materials are delivered online and distance students submit homework via e-mail and have exams proctored at their places of work to be faxed in for grading. A master's degree is comprised of 10 courses totaling 30 credit hours. Students can take as many courses per semester as their work and life schedules permit, thus setting their own pace toward their degrees. Employers may provide financial support for these graduate courses. Students wishing to participate in the UF EDGE program should contact the UF EDGE office at (352) 392-9670 or visit the website at www.ufedge.ufl.edu for more detailed information. UF EDGE and the UF College of Engineering are also part of the statewide delivery system known as The Florida Engineering Education Delivery System (FEEDS). Students pursuing a degree through UF EDGE and the College of Engineering are governed by the College's requirements, the academic unit to which they have been admitted, and the Graduate School.

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Florida Engineering Education Delivery System

(FEEDS)

The Florida Engineering Education Delivery System (FEEDS) is a cooperative effort to deliver graduate engineering courses, and degree and certificate programs via an array of distance learning technologies to engineers throughout Florida. Along with the University of Florida, participating universities include the colleges of engineering at Florida State University, Florida A & M University, Florida Atlantic University, Florida International University, the University of Central Florida, and the University of South Florida. Our FEEDS educational partners at Florida Gulf Coast University, the University of North Florida, and the University of West Florida help facilitate course delivery and program marketing. Graduate students associated with any of these universities have access to the graduate engineering courses offered via FEEDS throughout the state during the school term. Students wishing to participate in FEEDS and intending to register for classes at the University of Florida should do so by contacting the FEEDS Coordinator, E117 CSE (352) 392-9670 or by e-mail to feeds@eng.ufl.edu).

For detailed information, visit http://oeep.eng.ufl.edu. Students pursuing a degree through the College of Engineering are governed by its requirements, the academic unit to which they have been admitted, and the Graduate School.

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Office of Research

The University of Florida Office of Research is comprised of the Division of Sponsored Research, and the UF Research Foundation, which includes the Office of Technology Licensing. The Office of Research manages half a billion dollars annually in public and private grants. Royalty and licensing income exceeds $40 million annually and technologies developed at UF have led to the founding of dozens of companies.

The Division of Sponsored Research (DSR) was established in 1962 by an act of the Florida Legislature to manage and stimulate an expanding and balanced research program. DSR facilitates institutional approval for all extramural proposal submissions, accepts and administers grant awards, and negotiates contracts and other research-related agreements on behalf of the University of Florida.

Research, grant-in-aid, training, or educational service agreement proposals are processed and approved by DSR. Negotiations of sponsored awards are also the responsibility of the Division. DSR helps researchers identify possible sponsors for their projects, coordinates cross-disciplinary research activities, and disseminates information and University policies and procedures for the conduct of research.

The Office of Research provides funds for the Grinter Fellowship program. These fellowships are part of funding packages awarded by academic units to support recruitment of outstanding new graduate students. The Office of Research also supports individual graduate students by offering competitive travel grants and other types of awards. See details for the various programs at http://www.research.ufl.edu/researchsupport/internal_support.html. This office also provides an important centralized location for other internal and external funding opportunities by offering a host of resources at http://www.research.ufl.edu/researchsupport/.

The University of Florida established the University of Florida Research Foundation, Inc. (UFRF), a direct support organization, in June 1986 to promote, encourage and provide assistance to the research activities of the University faculty, staff and students. Incorporated by the State of Florida in August 1986, the not-for-profit organization provides a means by which research can be conducted flexibly and efficiently and by which discoveries, inventions, processes and work products of University of Florida faculty, staff and students can be transferred from the laboratory to the public. Funds generated by licensing such discoveries are used to enhance research at the University of Florida.

The **Office of Technology Licensing** (OTL) handles patenting, marketing, and licensing of intellectual property. The OTL works closely with UF inventors in identifying and protecting new inventions. All patents, copyrights, and trademarks are processed and managed by OTL. The OTL helps researchers develop confidentiality, mutual secrecy, and material transfer agreements.

For more information, contact:

The Office of Research
P.O. Box 115500
(352) 392-1582

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University Press of Florida

The University Press of Florida is the official scholarly publishing agency of the State University System of Florida. The Press (just off campus, at 15 NW 15th Street) reports to the President of the University, who supervises the Press on behalf of the 11 state universities. The statewide Council of Presidents is the governing board for the Press.

An advisory board, consisting of representatives from each of the 11 state universities, determines whether manuscripts submitted to it reflect appropriate academic, scholarly, and programmatic standards of the Press.

The Press publishes scholarly works of intellectual distinction and significance, books that contribute to improving the quality of higher education in Florida, and books of general and regional interest and usefulness to the people of Florida, reflecting their rich historical, cultural, and intellectual heritage and resources. The Press publishes works in the following fields: the Caribbean and Latin America; the Middle East; North American archaeology, American history, and culture; Native Americans; literary theory; medieval studies; architecture; ethnicity; natural history; conservation biology; the fine arts; and Floridiana.

Submit manuscripts to

The Editor-in-Chief,
University Press of Florida,
15 NW 15th Street,
Gainesville, FL 32611.

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The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

UF UNIVERSITY of FLORIDA GRADUATE SCHOOL

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STUDENT SERVICES

The information in this catalog is current as of July 2010. Please contact individual programs for any additional information or changes.

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Career Resource Center

The Career Resource Center (CRC), on the first floor of the J. Wayne Reitz Union, is the central agency for career planning, employment assistance, and internships and cooperative education (co-op) for UF students. The Center provides a full range of services for all graduate students.

Graduate students wishing to explore career interests, gain

experience through internship or co-op assignments, organize their job search campaign, or gain skills in portfolio development, resume/CV preparation, and interview techniques are invited to visit the Center. The Center has an extensive career library, with directories of employers and other career skills information. Graduate students seeking assistance resolving career planning or preparation issues can make appointments with one of the Center's career counselors and advisers. The CRC also offers workshops that address the specific career decision-making and job search concerns of graduate students.

Career Resource Center program and service information can be accessed on-line at http://www.crc.ufl.edu. Specific pages geared toward graduate students' career concerns can be found at http://www.crc.ufl.edu/gradservices.

Significant on-campus interviews with representatives from business industry, government, and education are coordinated by the Center each year. Graduate students are encouraged to create a **Gator CareerLink** account early to participate in these interviews. Creating a Gator CareerLink account will also grant access to search internship, co-op and full-time employment listings.

During the academic year, the Center also sponsors a number of **career fairs, workshops and employer information sessions** that bring employers to campus to talk to students about careers and jobs. These sessions are open to all majors and are an ideal way for graduate students to make contact with potential employers. For more information call (352) 392-1601 or visit http://www.crc.ufl.edu.

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Counseling and Wellness Center

The Counseling and Wellness Center (CWC) offers services to currently enrolled graduate students for personal, career, and educational concerns.

Professional counselors offer short-term individual, couples, and group counseling. There is no charge for the Center's confidential services. Topics of services for graduate students often include help with concerns related to academic success, time and stress management skills, anxiety and depression, personal and family relationships, adjustment to the culture, and other issues associated with transition.

Counseling and Wellness Center clinicians also provide a range of consultation and outreach programs to the campus community. Phone or in-person consultation is available for students, parents, faculty, and staff regarding any issues related to student development. The CWC clinicians serve as program resources for a

wide variety of student organizations and academic departments. The Center has an extensive training program for selected graduate students. The clinical staff teaches undergraduate and graduate courses in the Departments of Psychology and Counselor Education and guest lecture on a variety of psychological and wellness topics.

All CWC activities are conducted with sensitivity to the diversity of the students on a large, multicultural campus. For more information, phone (352) 392-1575, or visit http://www.counsel.ufl.edu.
The CWC is located at 3190 Radio Road.

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English Skills for International Students

The University of Florida makes available English language programs to help international graduate students improve their proficiency in English. These programs are 1) the English Language Institute, 2) Academic Written English, and 3) Academic Spoken English.

Applicants whose command of English is not as good as expected may be requested by their departments to attend the English Language Institute (ELI), an intensive English program designed to provide rapid gain in English proficiency. An ELI student may require one, two, or occasionally three semesters of full-time English study before entering Graduate School. Information about ELI is available in 315 Norman Hall.

The Academic Written English (AWE) program is designed to help foreign graduate students improve their writing ability. Applicants whose verbal GRE scores are below 320, or students who have been admitted provisionally with a score lower than required on a TOEFL (550 paper, 210 computer, 80 web), IELTS (6), or MELAB (77) may be required to take a writing test. Those demonstrating a lower proficiency than needed for successful performance in written tasks as determined by their academic unit may be required to take courses in written English. Information about the AWE program is available at the coordinator's office, 4131 Turlington Hall, telephone (352) 392-0639.

The Academic Spoken English (ASE) program is designed to help those students who expect to be Graduate Teaching Assistants at the University of Florida but who cannot demonstrate a high enough proficiency in English. Students who must raise speaking proficiency scores are advised to take EAP 5835, a course to improve general oral language skills. Information about ASE can be found at http://ase.ufl.edu/.

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Graduate Student E-mail Listserv and Website

The Graduate School communicates directly with enrolled graduate students' via e-mail using GatorLink e-mail addresses. Messages contain time-sensitive information about important deadlines. An archive of messages is available at http://lists.ufl.edu/archives/gradstudent-l.html.

Students must establish this free account and should regularly check their GatorLink e-mail. The Graduate School cannot maintain personal e-mail addresses. GatorLink has a website at http://www.gatorlink.ufl.edu to create and modify an account. Information about grants and fellowships, workshops, and other items relevant to graduate education are posted in the graduate student section of the student page at the myUFL portal: http://my.ufl.edu. Students should subscribe to this section and check it regularly.

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Graduate Newsletter

EXCEL, the Graduate School newsletter, is published annually in the spring to highlight graduate education at UF. For more information or to contribute a topic, contact the Graduate School, phone 392-4646.

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Graduate Minority Programs

The The Office of Graduate Minority Programs (OGMP) is defined by its student-centered support services. The OGMP is responsible for administering various multicultural educational programs that support and foster an intellectually and culturally diverse student population.

To accomplish this goal the staff actively works to recruit and retain students who are ethnic/cultural minorities (African Americans, Hispanics, Native Alaskans [Aleuts and Eskimos], Native Americans, and Native Pacific Islanders), underrepresented in their field of study (women in engineering, men in nursing, etc.), low-income, or first-generation students.

Among the development and funding opportunities available through OGMP are Florida Board of Education (BOE) Summer Program, Florida A&M (FAMU) Feeder Program, McKnight Doctoral Fellowship, UF/SFC Faculty Development Project, National Consortium for Graduate Degrees for Minorities in Engineering and Sciences, Inc. (GEM)Fellowship, Supplemental Retention Award, Delores Auzenne Dissertation Award, McNair Graduate Assistantship Program, NSF Florida Georgia Louis Stokes Alliance for Minority Participation Bridge to the Doctorate, NSF Atlantic Coast--Social, Behavioral and Economic Sciences Alliance, Campus Visitation Program (CVP), and professional development workshops.

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Graduate School Editorial Office

The Graduate School Editorial Office provides Format Requirements for theses and dissertations on the editorial page of the Graduate School website (http://gradschool.ufl.edu/editorial/introduction.html) to help students prepare their manuscripts for submission to the Editorial Office. The Graduate School Editorial Office facilitates the thesis and dissertation process by providing clear guidelines, checklists, and by outlining the procedures to follow when completing the thesis or dissertation. In order to complete degree requirements, all thesis and dissertation students must gain Final Clearance status with the Editorial Office by the posted deadlines for the term in which they intend for the degree to be awarded.

The following procedures apply to the Graduate School's editorial services to students.

— Upon submission to the Graduate School Editorial Office, a thesis or dissertation should be near-final and must be completely formatted. It will not be accepted as meeting first submission requirements if in draft form. Additionally, master's theses must already be defended before making submission to the Graduate School Editorial Office. Accordingly, the Final Exam data must be posted to GIMS by the department, before the document can be submitted to the Editorial Office for review. Subsequently, a master's student who does not defend the thesis prior to the first submission deadline will not be eligible for a degree award in the current term; nor is the student a clear-prior candidate to the following term, since unable to meet the first submission requirement.

— The thesis or dissertation must be of publishable quality and must be in a form suitable for publication, using the Graduate School's format requirements.

— The student's department is responsible for quality and scholarship.

— Graduate Council requires the Graduate School Editorial Office, as agents of the Dean of the Graduate School, to briefly review theses and dissertations for acceptable format, and to make recommendations as needed.

— The Application Support Center, although not a part of the Graduate School Editorial Office, provides assistance to students seeking help with the guidelines of the Editorial Office free of charge. Their services are invaluable to students concerned about meeting the submission standards of the Editorial Office. Students

should avail themselves of these services long before making first submission to the Editorial Office.

— The Graduate School Editorial Office maintains a list of formatters, editors, and binders that students may hire for a fee, if needed; however, the Application Support Center also offers many formatting and conversion services at reasonable rates as well.

— Format requirements:
http://gradschool.ufl.edu/pdf-files/editorial-format.pdf

— Format examples:
http://gradschool.ufl.edu/editorial/format.html#samples

— Checklist for master's theses:
http://gradschool.ufl.edu/pdf-files/checklist-thesis.pdf

— Checklist for doctoral dissertations:
http://gradschool.ufl.edu/pdf-files/checklist-dissertation.pdf

— Graduate School Editorial Office:
http://gradschool.ufl.edu/editorial/introduction.html

For more information, contact :
Graduate School Editorial Office
224-B, The Hub
Gainesville, FL
32611-5500

Phone
(352) 392-1282

E-mail
gradedit@aa.ufl.edu

Website
http://gradschool.ufl.edu/editorial/introduction.html

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Graduate Student Records

Graduate Student Records staff work with academic units to support students at all phases of their graduate careers, from admission through degree certification and graduation. The office is responsible for keeping the official graduate student record and ensuring compliance with all Graduate Council and University policies.

Changes to existing supervisory committee: A student, in consultation with his or her academic unit, may seek changes to an existing supervisory committee. Changes to a student's committee are allowed until midpoint of the term of degree award if the

defense has not occurred. No changes are allowed after the defense. For procedural details, contact the major academic unit.

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Graduate Student Council

The Graduate Student Council was formed in 1989 to foster interaction among graduate students on campus and to provide an agency for coordinating graduate student activities and programs. The GSC seeks the improvement of graduate student education through active and permanent communication with the Graduate School, the University administration, and the University of Florida Board of Trustees. It also represents the interests of graduate students at the student government, administration, local, state, and national levels. GSC is a dues-paying member of the National Association of Graduate and Professional Students.

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Graduate Student Handbook

The Graduate School provides additional information in the online Graduate Student Handbook: https://gradschool.ufl.edu/students/introduction.html.

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Housing

Graduate and Family Housing is available for single graduate students, graduate students with dependent children, and married graduate students.

Graduate students are housed in graduate and family housing villages. For information go to the Housing website: http://www.housing.ufl.edu. All applicants must apply to the University and have a UF ID number. Those who are interested in Graduate and Family Housing should apply as early as possible because of the demand for housing.

To be eligible for Graduate and Family housing, all residents must make normal progress toward a degree in consultation with academic departments and Graduate and Family Housing policies.

Please inquire at villages@housing.ufl.edu for more information about general eligibility and/or eligibility as it relates to academic status.

Applying for Housing

Each student must make personal arrangements for housing, either by applying to the Department of Housing and Residence Education

for assignment to University housing facilities or by obtaining accommodations off campus.

For application information and to submit an application:
http://www.housing.ufl.edu/apply/grad.php

For off-campus housing information:
http://www.offcampus.ufl.edu/

Graduate and Family Housing

Village apartments are unfurnished. Residents in all villages must furnish their own linens, dishes, rugs, curtains, or other similar items. Utilities are an additional expense and are billed with the rent.

Students choosing to live in Maguire Village are subject to maximum income limitations as established by the Department of Housing and Urban Development. More information about this regulation and Maguire Village is available at the following website:
http://www.housing.ufl.edu/facilities/gradfamily/maguire.php

Additional information about all Graduate and Family Housing facilities is available at the following website:
http://www.housing.ufl.edu/facilities/gradfamily/

For any general questions about Graduate and Family Housing please email villages@housing.ufl.edu or call 352.392.2171 extension 10321.

Off-Campus Life

The Off-Campus Life Department in the Dean of Students Office offers many resources and services to a wide variety of students including students currently living in the community; students moving off campus; students living on campus; and graduate, undergraduate, and incoming students new to the Gainesville community.

Services include the Off-Campus Life website (http://www.offcampus.ufl.edu), Gator Guide to Off-Campus Life, apartment locator (http://housing.offcampus.ufl.edu), one-on-one support for student and community issues and concerns, events for off-campus students and educational programming to help students adjust to living in the community. The publications and website include information and resources on budgeting, finding the right place to live, apartment locator, leases, city codes, landlord laws, and community and campus resources. All services are free to students.

For more information, visit our website (http://www.offcampus.ufl.edu); stop by the Off-Campus Life Office,

which is located on the 2nd floor of Peabody Hall; or call Off-Campus Life (352) 392-1261.

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Ombuds

The Office of the University Ombuds was established by the state legislature and reports through the Provost to the President. The Office helps students resolve problems and conflicts. It offers an informal avenue of redress for students' problems and grievances that arise in the course of interacting with the institution. By considering the problems in an unbiased way, the Ombuds works to achieve a fair resolution and works to protect the rights of all involved parties.

Resolving student academic issues: The Office of the Ombuds deals with student concerns of an academic nature. Students must first contact the instructor, the academic unit chair, and the college dean before seeking help from the Ombuds, although instances do exist where contact with the University Ombuds first is beneficial.

Resolving student non-academic issues: In many instances, non-academic issues can be easily and readily resolved for students merely by facilitating direct communication and effective listening. For other problems not related to academic issues, the Office of the Ombuds helps students contact the appropriate campus office for dealing with their problems.

For more information, visit http://www.ombuds.ufl.edu.

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Reading and Writing Center

The Reading and Writing Center is part of the Office of Academic Technology. Located in mezzanine area of Southwest Broward Hall, the Center offers one-on-one tutoring and writing help for both undergraduate and graduate students. The Center often helps people with application essays and personal statements for graduate school applications. It also offers help on papers written for graduate school classes, and theses or dissertations. The Center guarantees 30 minute sessions (longer if staff are not busy) to look over a student's writing. While multiple visits will give students feedback on the strengths and weaknesses in their writing, it is difficult to provide anything like a comprehensive reading of any document as long as most theses and dissertations. For information, visit http://at.ufl.edu/rwcenter. Phone (352) 392-6420.

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Speech, Language, and Hearing Clinics

The UF Speech and Hearing Clinic (fourth floor of Dauer Hall) offers

therapeutic and diagnostic services to persons with speech, language, and hearing disorders and to persons with dyslexia and other learning disabilities. Lessons for general accent reduction and diction may be arranged. These services are available to the University faculty and students. Therapy is scheduled between 8 a.m. and 5 p.m., Monday-Friday, with the Clinic being open in accordance with the University Calendar.

Students are encouraged to visit the Clinic's offices at 452 Dauer Hall. Additional clinics, at 1405 NW 13th Street and the dental tower, may be able to provide particular services as well.

The hearing health care team at the University of Florida Hearing Center at Hampton Oaks provides comprehensive assessment of hearing and balance disorders. Audiological and vestibular evaluation and treatment options are available for patients of all ages. Hearing aid repairs, maintenance and programming, custom earmolds, swim plugs, hearing aid batteries and supplies are all available at this convenient and accessible location.

For more information, visit http://slhs.phhp.ufl.edu/clinics.
To schedule an appointment, phone (352) 392-2113.

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Student Health Care Center

The Student Health Care Center (SHCC) is an accredited outpatient clinic that provides primary medical care, health education, disease prevention, psychiatry, and various specialty services. You can make convenient appointments with your healthcare provider at SHCC within 24 hours if you simply phone first (352-392-1161). Physicians, physician assistants, nurse practitioners, registered nurses, and dietitians are available at SHCC to meet your needs. All registered students are eligible for SHCC services. Postdoctoral students, students taking a semester off and spouses/domestic partners also may receive care at SHCC if they pay the off-semester fee.
Student health insurance plans are available for students to purchase if they are not covered by their own health insurance policies. The University provides health insurance (GatorGradCare) for graduate students who are on certain fellowships or assistantship appointments, based on their FTE assignment. Students with either student health insurance or GatorGradCare plans must use the SHCC for their health care needs. Students without health insurance are still eligible to utilize SHCC services; however, health insurance coverage is strongly recommended for all students.

The Student Health Care Center (SHCC) also offers a pharmacy, clinical laboratory services, radiology services, immunizations, foreign travel consultation, women's health care, physical and

massage therapy, specialized programs for students with eating disorders, an acute care/urgent clinic, and a sports medicine clinic. In addition, students can phone their individual medical teams and talk with a registered nurse to discuss medical concerns and questions.

Office visits with SHCC primary-care providers are provided at no additional cost. Charges are assessed for laboratory tests, X-rays, medical procedures, medications, physical therapy, massage therapy, or consultation with health care specialists.

Comprehensive services are offered at our main location on Fletcher Drive, on campus. Limited SHCC services also are available at our other locations: SHCC@Shands and SHCC@Corry Village (the Corry Village location currently offers massage therapy only).

For more information about our services, locations, and hours, visit http://www.shcc.ufl.edu.

HIV infection: The University's policy is to assess the needs of students, faculty or staff with HIV infection on a case-by-case basis. With permission of the affected individual, the director of the Student Health Care Center will help coordinate resources and services. The confidentiality of an individual's HIV status, and the individual's welfare, is respected. Breach of confidentiality of information obtained by a University employee in an official University capacity may result in disciplinary action.

Based on current medical information on risk of infection, the University does not isolate persons with HIV infection or AIDS from other individuals in the education or work setting. Furthermore, the University supports the continued participation, to the fullest extent reasonably possible, of these individuals in the campus educational/work environment. It is also the policy of the University to provide education that seeks to prevent the spread of HIV infection. Those individuals at risk for HIV infection are encouraged to get tested; those who are infected are urged to seek treatment. With current advances in HIV/AIDS treatment, early intervention is crucial to maintaining well being and delaying complications of the illness. In keeping with the Americans with Disabilities Act, the University considers HIV/AIDS to be a disability. Students or employees who are disabled with HIV infection or AIDS can use existing support services.

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UF International Center (UFIC)

The mission of the University of Florida International Center (UFIC) is to enhance the educational experience and environment of UF's students, faculty and staff by promoting a global perspective.

Located in 170 HUB, Stadium Road, the International Center helps bring the world to UF and bring UF to the world. The International Center is the University of Florida's liaison with foreign and domestic embassies and consulates and is responsible for maintaining compliance with federal regulations pertaining to international students, faculty and scholars.

For more information, contact the appropriate person at UFIC:

Phone: (352) 273-1540
Fax: (352) 392-5575
E-mail: ufic@ufic.ufl.edu
Website http://www.ufic.ufl.edu

International Student Services provides support services for international students through immigration document preparation, orientation, immigration services, and various workshops. These services include advising international students on academic, immigration, financial, cultural, and personal issues. All new international students are required to check-in with the International Center.

Exchange Visitor Services offers administrative, liaison, and support services for foreign national faculty, scholars, researchers and professionals. Additionally Exchange Visitor Services ensures that the university is in compliance with immigration laws and regulations affecting immigration statuses for sponsored foreign nationals and visiting scholars by providing technical and advisory information to the university community. Support services include assistance with immigration regulations compliance, pre-arrival procedures, and orientation to the campus and community.

Study Abroad Services administers a wide range of programs that give students the opportunity to live and study abroad while fulfilling degree requirements. Students can choose among faculty-led summer programs, exchange programs, and independent programs for the summer, a semester, or an academic year as well as spring break, Thanksgiving break and other programs. Various scholarships and other financial aid can be applied to help finance the international academic experience. UF exchange programs enable students to pay UF tuition while studying abroad. Study Abroad program assistants advise applicants on all aspects of UF approved programs, provide pre-departure orientations, and process the foreign transcript on return of the student. Study Abroad program details are available in the UFIC library or on the UFIC website.

Program Development helps UF faculty and students develop programs in international applied research, technical cooperation, workshops, outreach, and other international activities. Working closely with other centers, academic units, and colleges, PD promotes programs and projects that capitalize on the strengths of

UF's faculty and staff. UFIC administers the World Citizenship Program, an international internship program, which places students with nongovernmental organizations around the world.

UFIC houses a Peace Corps recruiting office and maintains a country specialist database that contains a list faculty with expertise in particular countries that anyone can search by country (http://www.ufic.ufl.edu/csd/index.asp).

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Workshops for Teaching Assistants

The Graduate School and the Office of Academic Technology (AT) Teaching Center offer an orientation and a series of workshops for teaching assistants to improve their instructional skills. The orientation and "getting started" workshop are mandatory for all graduate students starting teaching assignments. Some topics included in the workshop series are presentation skills, course and lecture planning, techniques for improving student attention and motivation, group dynamics, testing and grading, use of technology to enhance learning, and how to elicit and interpret feedback. TAs who complete a significant percentage of the workshops are awarded certificates. Participants may request videotaping of their classroom presentations and student feedback on strengths and weaknesses. To register or for more information go to The Resources for Teaching Assistants at http://www.teachingcenter.ufl.edu, call the AT Teaching Center, 392-2010, or visit the office on the ground level, Southwest Broward Hall. Teaching at the University of Florida: A Handbook for Teaching Assistants: is available at http://www.teachingcenter.ufl.edu/ta_development.html.

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St. Petersburg

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Ph.D., Dean, College of Agricultural and Life Sciences

PAUL J. D'ANIERI
Ph.D., Dean, College of Liberal Arts and Sciences

TERESA A. DOLAN,
D.D.S., M.P.H., Dean, College of Dentistry

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Ph.D., Dean, College of Health and Human Performance

CATHERINE EMIHOVICH,
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Ph.D., Dean, College of Nursing

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STEPHEN J. PRITZ, JR.,
B.S., University Registrar

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Ph.D., Dean, College of Pharmacy

JUDITH RUSSELL,
M.S., Dean, University Libraries

DAVID SAMMONS,
Ph.D., Dean, International Center

JEN DAY SHAW,
Ph.D., Assistant V.P. for Student Affairs, Dean of Students

CHRISTOPHER SILVER,
Ph.D., Dean, College of Design, Construction, and Planning

JOHN W. WRIGHT II,
Ph.D., Dean, College of Journalism and Communications

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Purpose and Mission of the University

The University of Florida is a public land-grant, sea-grant and space-grant research university, one of the most comprehensive in the United States. The University encompasses virtually all academic and professional disciplines. It is the largest and oldest of Florida's eleven universities and a member of the Association of American Universities. Its faculty and staff are dedicated to the common pursuit of the University's threefold mission: teaching, research and service.

The University of Florida belongs to a tradition of great universities. Together with our undergraduate and graduate students, UF faculty participate in an educational process that links the history of Western Europe with the traditions and cultures of all societies, explores the physical and biological universes, and nurtures generations of young people from diverse backgrounds to address the needs of our societies. The University welcomes the full exploration of its intellectual boundaries and supports its faculty and students in the creation of new knowledge and the pursuit of new ideas.

Teaching is a fundamental purpose of this university at both the undergraduate and graduate levels. Research and scholarship are integral to the education process and to the expansion of our understanding of the natural world, the intellect and the senses. Service reflects the University's obligation to share the benefits of its research and knowledge for the public good.

These three interlocking elements span all of the University's academic disciplines and represent the University's commitment to lead and serve the state of Florida, the nation, and the world by pursuing and disseminating new knowledge while building upon the experiences of the past. The University of Florida aspires to advance by strengthening the human condition and improving the quality of life.

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History of the University

The University of Florida traces its beginnings to 1853 when the state-funded East Florida Seminary acquired the private Kingsbury Academy in Ocala. After the Civil War, the seminary was moved to Gainesville. It was consolidated with the state's land-grant Florida Agricultural College, then in Lake City, to become the University of

Florida in 1906. Until 1947, UF enrolled men only and was one of only three state universities. The others were Florida State College for Women (now FSU) and Florida A&M. In 1947, the student body numbered 8,177 men and 601 women.

Today, UF is the fifth largest university in the nation. In the fall of 2009, the total student population was 50,844, including 11,823 graduate students. There were 5,597 women and 6,224 men in graduate programs.

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Government of the University

A 13-member Board of Trustees governs the University of Florida. The governor appoints six of the trustees, and five are appointed by the 17-member Florida Board of Governors, which governs the State University System as a whole. The university's student body president and faculty senate chair also serve on the Board of Trustees as ex officio members. Trustees are appointed for staggered five-year terms.

The University of Florida Board of Trustees is a public body corporate with all the powers and duties set forth by law and by the Board of Governors. The University of Florida president serves as the executive officer and corporate secretary of the Board of Trustees and is responsible to the board for all operations of the university. University affairs are administered by the president through the university administration, with the advice and assistance of the Faculty Senate, various committees appointed by the president, and other groups or individuals as requested by the president.

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NAME	TITLE	DEPARTMENT
Aaron, Jessica	Assistant Professor	Spanish and Portuguese Studies
Abbott, Jeffrey	Assistant Professor	Veterinary Medicine
Abboud, Khalil	Scientist	Chemistry
Abd-Elrahman, Amr	Assistant Professor	Forest Resources and Conservation
Abernathy, Cammy	Professor	Materials Science and Engineering
Abrams, Lise	Associate Professor	Psychology
Acosta, Darin	Professor	Physics
Adams, Alyson	Clinical Assistant Professor	Teaching and Learning
Adams, Charles	Professor	Food and Resource Economics
Adams, Christina	Associate Professor	Clinical and Health Psychology
Adams, Damian	Assistant Professor	Forest Resources and Conservation
Adams, Peter	Assistant Professor	Geological Sciences
Adams, Sean	Associate Professor	History
Adams, Thomasenia	Professor	Teaching and Learning
Adesogan, Adegbola	Professor	Animal Sciences
Adhihetty, Peter	Assistant	Applied Physiology and

	Professor	Kinesiology
Adler, Jeffrey	Professor	History
Agbandje-McKenna, Mavis	Professor	Biochemistry and Molecular Biology
Agresti, Alan	Distinguished Professor	Statistics
Ahuja, Ravindra	Professor	Industrial and Systems Engineering
Ai, Chunrong	Professor	Economics
Akcali, Elif	Associate Professor	Industrial and Systems Engineering
Akers, Ronald	Professor	Sociology
Al-amin, Mona	Assistant Professor	Health Services Research, Management, and Policy
Alba, Joseph	Distinguished Professor	Marketing
Alexander, Laurence	Professor	Journalism and Communications
Algina, James	Professor	Human Development and Organizational Studies in Education
Alladi, Krishnaswa	Professor	Mathematics
Alleman, Arthur	Professor	Veterinary Medicine
Allen, Charles	Professor	Biochemistry and Molecular Biology
Allen, Leon	Professor	Agronomy
Allen, Micheal	Professor	Fisheries and Aquatic Sciences
Allison, Robert	Associate Scientist	Biochemistry and Molecular Biology
Allred, David	Professor	Veterinary Medicine
Altman, Ida	Professor	History
Altmann, Lori	Assistant Professor	Speech, Language and Hearing Sciences
Altmeyer, Timothy	Assistant Professor	Theatre and Dance
Altpeter, Fredy	Associate Professor	Agronomy
Alva, Ashok	Professor	Soil and Water Science
Alvarez-Castro, Luis	Assistant Professor	Spanish and Portuguese Studies
Amatea, Ellen	Professor	Human Development and Organizational Studies in Education
Amoko, Apollo	Assistant Professor	English
Anantharam, Anita	Assistant Professor	Women's Studies
Anderson, Leslie	Professor	Political Science
Anderson, Peter	Professor	Physiology and Functional Genomics
Anderson, Timothy	Distinguished	Chemical Engineering

	Professor	
Andraka, Bohdan	Associate Scientist	Physics
Andresen, Elena	Professor	Public Health
Andreu, Michael	Assistant Professor	Forest Resources and Conservation
Angerhofer, Alexander	Associate Professor	Chemistry
Annable, Michael	Professor	Environmental Engineering Sciences
Antes, Theresa	Associate Professor	Language, Literature and Culture
Anton, Stephen	Assistant Professor	Clinical and Health Psychology
Antonelli, Patrick	Professor	Communication Sciences and Disorders
Antony, Veena	Professor	Molecular Genetics and Microbiology
Aponick, Aaron	Assistant Professor	Chemistry
Appleton, Billy	Professor	Materials Science and Engineering
Arakere, Nagaraj	Associate Professor	Mechanical and Aerospace Engineering
Arbuckle, Linda	Professor	Art and Art History
Archbald, Louis	Professor	Veterinary Medicine
Archer, Douglas	Professor	Food Science and Human Nutrition
Archer, Wayne	Professor	Finance, Insurance and Real Estate
Ardelt, Monika	Associate Professor	Sociology
Arfi, Badredine	Associate Professor	Political Science
Aris, John	Associate Professor	Anatomy and Cell Biology
Armon, Shifra	Associate Professor	Spanish and Portuguese Studies
Armstrong, Cory	Associate Professor	Journalism and Communications
Armstrong, Helenjane	Professor	Geography
Arnold, David	Associate Professor	Electrical and Computer Engineering
Arreola, Manuel	Clinical Assistant Professor	Nuclear and Radiological Engineering
Arrington, Larry	Professor	Agricultural Education and Communication
Arroyo, Amauri	Associate Professor	Electrical and Computer Engineering

Arthington, John	Professor	Animal Sciences
Arthurs, Steven	Assistant Professor	Entomology and Nematology
Arvanitis, Loukas	Professor Emeritus	Forest Resources and Conservation
Asal, Nabih	Professor	Epidemiology and Biostatistics
Asare, Stephen	Associate Professor	Accounting
Ash, Carol Reed	Kirbo Eminent Scholar	Nursing
Ashkanazi, Glenn	Clinical Associate Professor	Clinical and Health Psychology
Ashton, Patricia	Professor	Human Development and Organizational Studies in Education
Asthagiri, Aravind	Assistant Professor	Chemical Engineering
Atkinson, Mark	Eminent Scholar	Pathology, Immunology and Laboratory Medicine
Aukhil, Ikramuddin	Professor	Dentistry
Ault, Donald	Professor	English
Austin, James	Assistant Professor	Fisheries and Aquatic Sciences
Austin, Sharon	Associate Professor	Political Science
Auxter, Thomas	Associate Professor	Philosophy
Avery, Paul	Professor	Physics
Aytug, Haldun	Associate Professor	Information Systems and Operations Management
Babanikos, James	Associate Professor	Journalism and Communications
Babb, Florence	Professor	Women's Studies
Baber, Willie	Professor	Anthropology
Baccaglini, Lorena	Assistant Professor	Dentistry
Bachmann, Roger	Professor	Fisheries and Aquatic Sciences
Baciak, James	Assistant Professor	Nuclear and Radiological Engineering
Bacon, Nicholas	Clinical Assistant Professor	Veterinary Medicine
Bacus, James	Associate Professor	Animal Sciences
Badinga, Lokenga	Associate Professor	Animal Sciences
Baer, Charles	Associate Professor	Biology
Bai, Sherman	Associate Professor	Industrial and Systems Engineering

Bailey, Lynn	Professor	Food Science and Human Nutrition
Baker, Henry	Professor	Molecular Genetics and Microbiology
Baker, Patrick	Research Assistant Professor	Fisheries and Aquatic Sciences
Baker, Shirley	Associate Professor	Fisheries and Aquatic Sciences
Baker, Stephen	Professor	Pharmacology and Therapeutics
Baker, Susan	Professor	Romance Languages and Literatures
Balachandar, Sivaramakrishnan	Professor	Mechanical and Aerospace Engineering
Baldwin, Elizabeth	Professor	Food Science and Human Nutrition
Bandyopadhyay, Reba	Assistant Scientist	Astronomy
Bandyopadhyay, Subhajyoti	Associate Professor	Information Systems and Operations Management
Banerjee, Arunava	Associate Professor	Computer and Information Science and Engineering
Baney, Ronald	Research Scientist	Materials Science and Engineering
Banks, Scott	Associate Professor	Mechanical and Aerospace Engineering
Bannister, Michael	Associate In	Forest Resources and Conservation
Barbazuk, William	Assistant Professor	Biology
Barber, David	Associate Professor	Veterinary Medicine
Barbet, Anthony	Professor	Veterinary Medicine
Barfield, Carl	Professor	Entomology and Nematology
Barkin, Jeffrey	Associate Professor	Political Science
Barksdale, E.	Professor	Language, Literature and Culture
Barletta, Barbara	Professor	Art and Art History
Barnard, Donald	Courtesy Associate Professor	Entomology and Nematology
Barnard, Edward	Assistant Professor	Plant Pathology
Barnes, Grenville	Associate Professor	Forest Resources and Conservation
Barnett, Rosemary	Associate Professor	Family, Youth and Community Sciences
Barooah, Prabir	Assistant Professor	Mechanical and Aerospace Engineering
Barr, Juliana	Associate	History

	Professor	
Barradas, Efrain	Professor	Spanish and Portuguese Studies
Barrett, Douglas	Professor	Molecular Genetics and Microbiology
Barrick, R	Professor	Agricultural Education and Communication
Barrie, Kathleen	Clinical Professor	Veterinary Medicine
Bartlett, Rodney	Graduate Research Professor	Chemistry
Bartoshuk, Linda	Professor	Dentistry
Bartz, Jerry	Associate Professor	Plant Pathology
Bashirullah, Rizwan	Associate Professor	Electrical and Computer Engineering
Basler, Paul	Professor	Music
Batich, Christopher	Professor	Materials Science and Engineering
Battelle, Barbara	Professor	Neuroscience
Battiste, Merle	Professor	Chemistry
Bauer, Russell	Professor	Clinical and Health Psychology
Baughman, Robert	Associate Professor	Pharmaceutics
Baweja, Vandana	Assistant Professor	Architecture
Baylis, Christine	Professor	Physiology and Functional Genomics
Beaulieu, Lionel	Professor	Family, Youth and Community Sciences
Becher, Max	Assistant Professor	Art and Art History
Beck, Howard	Professor	Agricultural and Biological Engineering
Becnel, James	Assistant Professor	Entomology and Nematology
Beebe, Roger	Associate Professor	English
Behar-Horenstein, Linda	Professor	Human Development and Organizational Studies in Education
Behnke, Bradley	Assistant Professor	Applied Physiology and Kinesiology
Behringer, Donald	Research Assistant Professor	Fisheries and Aquatic Sciences
Behrman, Andrea	Associate Professor	Physical Therapy
Behrns, Kevin	Professor	Pharmacology and Therapeutics
Bejleri, Ilir	Associate	Urban and Regional Planning

	Professor	
Beland, Robert	Associate Professor	Tourism, Recreation, and Sport Management
Belk, Dave	Assistant Professor	Mechanical and Aerospace Engineering
Bender, Bradley	Professor	Molecular Genetics and Microbiology
Bennett, Jerry	Professor	Agronomy
Benson, Harold	Professor	Information Systems and Operations Management
Benya, Richard	Associate Professor	Pharmacology and Therapeutics
Berardo, Donna	Associate Professor	Pharmaceutical Outcomes and Policy
Berg, Sanford	Distinguished Service Professor	Economics
Berg, William	Professor	Psychology
Bergeron, Raymond	Eminent Scholar	Medicinal Chemistry
Bergmann, Peter	Associate Professor	History
Berkovich, Alexander	Associate Professor	Mathematics
Bermudez, Manuel	Associate Professor	Computer and Information Science and Engineering
Bernard, H. Russell	Professor Emeritus	Anthropology
Bernhard, Michael	Eminent Scholar	Political Science
Bernier, Ulrich	Courtesy Assistant Professor	Entomology and Nematology
Berns, Kenneth	Distinguished Professor	Molecular Genetics and Microbiology
Berry III, Clifford	Professor	Veterinary Medicine
Bertholf, Roger	Professor	Pathology, Immunology and Laboratory Medicine
Bhattacharyya, Indraneel	Associate Professor	Dentistry
Bimstein, Enrique	Professor	Dentistry
Binford, Michael	Professor	Geography
Biro, John	Professor	Philosophy
Bishop, Michelle	Research Assistant Professor	Clinical and Health Psychology
Biswas, Amlan	Associate Professor	Physics
Bizon, Jennifer	Associate Professor	Neuroscience
Bjorndal, Karen	Professor	Biology

Blackband, Stephen	Professor	Neuroscience
Blackburn, Jason	Assistant Professor	Geography
Blair, Roger	Professor	Economics
Blakeslee, George	Professor	Forest Resources and Conservation
Blanco, Andre	Assistant Professor	Urban and Regional Planning
Bleiweis, Arnold	Professor Emeritus	Oral Biology
Block, Louis	Professor	Mathematics
Bloem, Stephanie	Courtesy Assistant Professor	Entomology and Nematology
Blondeau, Helene	Associate Professor	Language, Literature and Culture
Bloom, David	Professor	Molecular Genetics and Microbiology
Bloom, Kathaleen	Associate Professor	Nursing
Bloom, Linda	Professor	Biochemistry and Molecular Biology
Bloom, Rori	Assistant Professor	Language, Literature and Culture
Bloomquist, David	Associate Professor	Civil and Coastal Engineering
Bloomquist, Jeffrey	Professor	Entomology and Nematology
Blount, Ann	Associate Professor	Agronomy
Bluck, Susan	Associate Professor	Psychology
Blum, Sylvie	Associate Professor	Language, Literature and Culture
Bobroff, Linda	Professor	Family, Youth and Community Sciences
Boger, David	Distinguished Professor	Chemical Engineering
Boggs, Stephen	Associate Professor	Clinical and Health Psychology
Boginski, Vladimir	Assistant Professor	Industrial and Systems Engineering
Bohlen, Patrick	Assistant Professor	Soil and Water Science
Bohn, Kimberly	Assistant Professor	Forest Resources and Conservation
Boinski, Sue	Professor	Anthropology
Bolch, Wesley	Professor	Nuclear and Radiological Engineering
Bolser, Donald	Professor	Veterinary Medicine
Bolten, Alan	Assistant	Biology

	Scientist	
Bolton, Elizabeth	Professor	Family, Youth and Community Sciences
Boman, Brian	Professor	Agricultural and Biological Engineering
Bomberger, William	Associate Professor	Economics
Bona, Miklos	Professor	Mathematics
Bonczek, James	Senior Lecturer	Soil and Water Science
Bondy, Elizabeth	Professor	Teaching and Learning
Bonzongo, Jean-Claud	Associate Professor	Environmental Engineering Sciences
Boote, Kenneth	Professor	Agronomy
Booth, Raymond	Professor	Medicinal Chemistry
Borg, Marian	Associate Professor	Sociology
Boring, Lindsay	Professor	Forest Resources and Conservation
Borisova, Tatiana	Assistant Professor	Food and Resource Economics
Borovsky, Dov	Professor	Entomology and Nematology
Borsa, Paul	Associate Professor	Applied Physiology and Kinesiology
Borst, Stephen	Associate Professor	Applied Physiology and Kinesiology
Borum, Peggy	Professor	Food Science and Human Nutrition
Bosman, Gijs	Professor	Electrical and Computer Engineering
Boucias, Drion	Professor	Entomology and Nematology
Boulton, Michael	Professor	Anatomy and Cell Biology
Bourne, Gerald	Research Assistant Scientist	Materials Science and Engineering
Bova, Frank	Professor	Nuclear and Radiological Engineering
Bowen, Walter	Lecturer	Soil and Water Science
Bowers, Clifford	Associate Professor	Chemistry
Bowers, Dawn	Professor	Clinical and Health Psychology
Boxer, Diana	Professor	Linguistics
Boyer, Treavor	Assistant Professor	Environmental Engineering Sciences
Boykin, P. Oscar	Assistant Professor	Electrical and Computer Engineering
Boyland, Philip	Professor	Mathematics
Boyles, Jesse	Associate Professor	Accounting
Bradley, Margaret	Research Professor	Psychology
Brady, L. Jeannine	Professor	Oral Biology

Braith, Randy	Professor	Applied Physiology and Kinesiology
Brajter-Toth, Anna	Associate Professor	Chemistry
Branch, Lyn	Professor	Wildlife Ecology and Conservation
Branch, Marc	Professor	Psychology
Brandt, Steven	Associate Professor	Anthropology
Branham, Marc	Associate Professor	Entomology and Nematology
Brantley, Richard	Professor	English
Brantly, Mark	Professor	Molecular Genetics and Microbiology
Brateman, Libby	Associate Professor	Nuclear and Radiological Engineering
Braun, Edward	Associate Professor	Biology
Brauner, Yariv	Professor	Taxation
Brechner, Beverly	Professor	Mathematics
Brecke, Barry	Professor	Agronomy
Brendemuhl, Joel	Professor	Animal Sciences
Brennan, Anthony	Professor	Materials Science and Engineering
Brenner, Lyle	Associate Professor	Marketing
Brenner, Mark	Professor	Geological Sciences
Brey, Wallace	Professor	Chemistry
Brito, Janete	Courtesy Assistant Professor	Entomology and Nematology
Brlansky, Ronald	Professor	Plant Pathology
Broad, Kendal	Associate Professor	Sociology
Broadway, Kenneth	Professor	Music
Brocchieri, Luciano	Assistant Professor	Molecular Genetics and Microbiology
Brockmann, H. Jane	Professor	Biology
Brooks, Dennis	Professor	Veterinary Medicine
Brooks, James	Professor	Mathematics
Brophy, Timothy	Associate Professor	Music
Broschat, Timothy	Professor	Environmental Horticulture
Brovelli, Ernesto	Courtesy Professor	Horticultural Science
Brown, Daniel	Associate Professor	Veterinary Medicine
Brown, David	Associate Professor	Finance, Insurance and Real Estate

Brown, Kelli	Professor	Health Education and Behavior
Brown, Kevin	Associate Professor	Biochemistry and Molecular Biology
Brown, M. Leann	Associate Professor	Political Science
Brown, Mark	Associate Professor	Food and Resource Economics
Brown, Mark	Professor	Environmental Engineering Sciences
Brown, Mary	Professor	Veterinary Medicine
Brown, Murray	Professor	Veterinary Medicine
Brown, Randall	Professor	Soil and Water Science
Brown, Richmond	Associate Professor	Latin American Studies
Brown, Thomas	Professor	Oral Biology
Brownell, Mary	Professor	Special Education, School Psychology and Early Childhood Studies
Brucat, Philip	Associate Professor	Chemistry
Brumback, Babette	Associate Professor	Public Health
Bruna, Emilio	Associate Professor	Wildlife Ecology and Conservation
Bruner, Steven	Associate Professor	Chemistry
Brushwood, David	Professor	Pharmaceutical Outcomes and Policy
Bryant, Marsha	Associate Professor	English
Bubb, Michael	Associate Professor	Biochemistry and Molecular Biology
Bucher, Dirk	Assistant Professor	Neuroscience
Bucklin, Ray	Professor	Agricultural and Biological Engineering
Buhr, Kenneth	Assistant Professor	Agronomy
Bukoveck, Yanci	Associate Professor	Theatre and Dance
Bungert, Jorg	Professor	Biochemistry and Molecular Biology
Burchfield, David	Professor	Physiology and Functional Genomics
Bures, Regina	Assistant Professor	Sociology
Burg, Mary Ann	Associate Professor	Sociology
Burke, Brian	Professor	Anatomy and Cell Biology
Burkhardt, Robert	Professor	Food and Resource Economics
Burks, Thomas	Associate	Agricultural and Biological

	Professor	Engineering
Burleigh, J.	Assistant Professor	Biology
Burne, Robert	Professor	Oral Biology
Burns, Allan	Professor	Anthropology
Burrichter, Ronald	Professor	Music
Burrows, Colin	Professor	Veterinary Medicine
Burt, Martha	Clinical Assistant Professor	Pathology, Immunology and Laboratory Medicine
Burt, Richard	Professor	English
Buss, Eileen	Associate Professor	Entomology and Nematology
Bussing, Regina	Professor	Clinical and Health Psychology
Butcher, Gary	Professor	Veterinary Medicine
Butcher, Rebecca	Assistant Professor	Chemistry
Butler, Jason	Associate Professor	Chemical Engineering
Butler, Margaret	Assistant Professor	Music
Butterweck, Veronika	Associate Professor	Pharmaceutics
Byatt, John	Assistant Professor	Animal Sciences
Byrd, Charles	Research Assistant Professor	Tourism, Recreation, and Sport Management
Byrd, Jason	Assistant Professor	Veterinary Medicine
Byrne, Barry	Professor	Molecular Genetics and Microbiology
Caes, Christopher	Assistant Professor	Language, Literature and Culture
Cailler, Bernadette	Professor	Romance Languages and Literatures
Cain, Brian	Professor	Biochemistry and Molecular Biology
Calfee, Dennis	Professor	Taxation
Calin, William	Graduate Research Professor	Language, Literature and Culture
Calluori Holcombe, Anna	Professor	Art and Art History
Calvert, Clay	Eminent Scholar	Journalism and Communications
Calvert, David	Professor	Soil and Water Science
Campbell, Dale	Professor	Human Development and Organizational Studies in Education
Campbell-	Research	Veterinary Medicine

Thompson, Martha	Professor	
Campins, Humberto	Professor	Astronomy
Campos, Michelle	Assistant Professor	History
Canfield, Daniel	Professor	Fisheries and Aquatic Sciences
Cantrell, Amy	Clinical Assistant Professor	Epidemiology and Biostatistics
Cao, Yun	Associate Professor	Chemistry
Capehart, Barney	Professor Emeritus	Industrial and Systems Engineering
Capinera, John	Professor	Entomology and Nematology
Caputo, Nina	Associate Professor	Religion
Carlson, David	Courtesy Associate Professor	Entomology and Nematology
Carmel-Gilfilen, Candy	Assistant Professor	Interior Design
Carney, Paul	Professor	Neuroscience
Carpenter, Ronald	Professor	English
Carr, Charles	Assistant Professor	Animal Sciences
Carr, Margaret	Professor	Landscape Architecture
Carrillo, Janice	Associate Professor	Information Systems and Operations Management
Carrion-Flores, Carmen	Assistant Professor	Food and Resource Economics
Carroll, Bruce	Associate Professor	Mechanical and Aerospace Engineering
Carter, Christy	Assistant Professor	Neuroscience
Carter, Douglas	Professor	Forest Resources and Conservation
Carter, Hannah	Assistant Professor	Agricultural Education and Communication
Carthy, Raymond	Assistant Professor	Wildlife Ecology and Conservation
Casella, George	Distinguished Professor	Statistics
Castellano, Ronald	Associate Professor	Chemistry
Castleman, William	Professor	Veterinary Medicine
Caswell, Thomas	Associate University Librarian	Art and Art History
Catalanotto, Frank	Professor	Dentistry
Cato, Bertha	Associate Professor	Tourism, Recreation, and Sport Management

Cato, James	Professor	Food and Resource Economics
Cattafesta III, Louis	Professor	Mechanical and Aerospace Engineering
Caudle, Robert	Professor	Dentistry
Cauraugh, James	Professor	Applied Physiology and Kinesiology
Cavanaugh, Catherine	Associate Professor	Teaching and Learning
Cave, Ronald	Associate Professor	Entomology and Nematology
Caviedes, Cesar	Professor	Geography
Cazacu, Oana	Associate Professor	Mechanical and Aerospace Engineering
Cech, John	Professor	English
Cellinese, Nicoletta	Assistant Curator	Botany
Cenzer, Douglas	Professor	Mathematics
Ceobanu, Alin	Assistant Professor	Sociology
Cha, Seunghee	Assistant Professor	Dentistry
Chadik, Paul	Associate Professor	Environmental Engineering Sciences
Chakravarthy, Animesh	Assistant Scientist	Mechanical and Aerospace Engineering
Chalfin, Brenda	Associate Professor	Anthropology
Chambers, John	Assistant Professor	Psychology
Chan, Edward	Professor	Oral Biology
Chan, Ho Bun	Associate Professor	Physics
Chan-Olmsted, Sylvia	Professor	Journalism and Communications
Chance, Sandra	Professor	Journalism and Communications
Chaney, Elizabeth	Assistant Professor	Health Education and Behavior
Chaney, Jerry Don	Assistant Professor	Health Education and Behavior
Chang, Lung-Ji	Professor	Molecular Genetics and Microbiology
Channell, James	Distinguished Professor	Geological Sciences
Chapman, Frank	Associate Professor	Fisheries and Aquatic Sciences
Chase, Chadwick	Assistant Professor	Animal Sciences
Chauhan, Anuj	Associate Professor	Chemical Engineering
Chegini, Nasser	Professor	Anatomy and Cell Biology

Chen, Shigang	Associate Professor	Computer and Information Science and Engineering
Chen, Sixue	Assistant Professor	Biology
Chen, Su-Shing	Professor Emeritus	Computer and Information Science and Engineering
Chen, Wei	Professor	Health Education and Behavior
Chen, Youping	Assistant Professor	Mechanical and Aerospace Engineering
Chen, Yunmei	Professor	Mathematics
Cheng, Hai Ping	Professor	Physics
Cheng, Hsing	Associate Professor	Information Systems and Operations Management
Cheng, Jing	Assistant Professor	Epidemiology and Health Policy Research
Chennault, Cynthia	Associate Professor	Language, Literature and Culture
Cherry, Ronald	Professor	Entomology and Nematology
Chesrown, Sarah	Professor	Biochemistry and Molecular Biology
Child, Brian	Associate Professor	Geography
Chini, Abdol	Professor	Building Construction
Chmielewski, Terese	Associate Professor	Physical Therapy
Chobaz, Raymond	Associate Professor	Music
Choe, Keith	Assistant Professor	Biology
Chourey, Prem	Professor	Agronomy
Chow, Yuan-Chieh	Professor	Computer and Information Science and Engineering
Christman, Mary	Associate Professor	Statistics
Christou, George	Professor	Chemistry
Chun, Paul	Professor	Biochemistry and Molecular Biology
Chung, Jacob	Eminent Scholar	Mechanical and Aerospace Engineering
Chung, Kuang-Ren	Associate Professor	Plant Pathology
Cichra, Charles	Professor	Fisheries and Aquatic Sciences
Ciesielski, Paul	Associate Professor	Geological Sciences
Cilek, James	Professor	Entomology and Nematology
Ciment, Jill	Professor	English
Ciupe, Mihai	Associate Professor	Theatre and Dance
Clanton, Thomas	Professor	Applied Physiology and Kinesiology
Clapp, William	Clinical	Pathology, Immunology and

	Associate Professor	Laboratory Medicine
Clare-Salzler, Michael	Professor	Pathology, Immunology and Laboratory Medicine
Clark, Arthur	Professor	Dentistry
Clark, Damon	Assistant Professor	Economics
Clark, Ira	Professor	English
Clark, Mark	Associate Professor	Soil and Water Science
Clark, Mary Ann	Associate Professor	Human Development and Organizational Studies in Education
Clark, Nancy	Associate Professor	Architecture
Clark, Wallis	Professor	Fisheries and Aquatic Sciences
Cleary, Johanna	Associate Professor	Journalism and Communications
Clemmons, Roger	Associate Professor	Veterinary Medicine
Clouser, Rodney	Professor	Food and Resource Economics
Coady, Maria	Associate Professor	Teaching and Learning
Cogle, Christopher	Assistant Professor	Anatomy and Cell Biology
Cohen, Donald	Professor	Dentistry
Cohen, Donna	Associate Professor	Architecture
Cohen, Matthew	Assistant Professor	Forest Resources and Conservation
Colahan, Patrick	Professor	Veterinary Medicine
Coleman, Samuel	Professor	Animal Sciences
Collazo, Jaime	Professor	Wildlife Ecology and Conservation
Collier, Charles	Professor	Law
Collings, Peter	Assistant Professor	Anthropology
Collins, James	Assistant Professor	Food Science and Human Nutrition
Colon, Elayne	Assistant Scholar	Special Education, School Psychology and Early Childhood Studies
Colquitt, Jason	Professor	Management
Colvin, Daniel	Professor	Agronomy
Comerford, Nicholas	Professor	Soil and Water Science
Condit, Richard	Professor	Molecular Genetics and Microbiology
Conley, Richard	Associate Professor	Political Science
Connaughton,	Associate	Tourism, Recreation, and Sport

Daniel	Professor	Management
Connelly, Cynthia	Associate Professor	Entomology and Nematology
Conrad, Kirk	Professor	Physiology and Functional Genomics
Consolazio, Gary	Associate Professor	Civil and Coastal Engineering
Conway, Tim	Assistant Professor	Clinical and Health Psychology
Conwill, William	Assistant Professor	Human Development and Organizational Studies in Education
Cook, Michael	Lecturer	Building Construction
Cook, Robert	Associate Professor	Public Health
Cook, Ronald	Professor	Civil and Coastal Engineering
Cooke, Alan	Associate Professor	Marketing
Cooper, Brian	Professor	Neuroscience
Cooper-DeHoff, Rhonda	Associate Professor	Pharmaceutics
Correll, Melanie	Associate Professor	Agricultural and Biological Engineering
Cottrell, Catherine	Assistant Professor	Psychology
Courtney III, Charles	Professor	Veterinary Medicine
Cousins, Robert	Eminent Scholar	Food Science and Human Nutrition
Cowles, Heidi	Assistant Professor	Linguistics
Craciun, Valentin	Research Associate Scientist	Materials Science and Engineering
Craig, Stephen	Professor	Political Science
Crane, Carl	Professor	Mechanical and Aerospace Engineering
Crary, Michael	Professor	Speech, Language and Hearing Sciences
Crawford, Patti	Clinical Assistant Professor	Veterinary Medicine
Crew, Richard	Associate Professor	Mathematics
Crisalle, Oscar	Professor	Chemical Engineering
Cristescu, Nicolae	Graduate Research Professor	Mechanical and Aerospace Engineering
Criswell, David	Associate Professor	Applied Physiology and Kinesiology
Crockett, Jean	Professor	Special Education, School

		Psychology and Early Childhood Studies
Croker, Byron	Professor	Pathology, Immunology and Laboratory Medicine
Crook, Larry	Professor	Music
Cropper, Wendell	Associate Professor	Forest Resources and Conservation
Cross, Alan	Assistant Professor	Veterinary Medicine
Crosson, Bruce	Professor	Clinical and Health Psychology
Crow, William	Associate Professor	Entomology and Nematology
Cuda, James	Associate Professor	Entomology and Nematology
Culen, Gerald	Associate Professor	Family, Youth and Community Sciences
Culp, David	Professor	Dentistry
Curta, Florin	Professor	History
Curtis, Jennifer	Professor	Chemical Engineering
Cynthia, Figueroa-Haas	Clinical Assistant Professor	Nursing
Czarnecka, Eva	Associate Scientist	Microbiology and Cell Science
D'amico, Robert	Professor	Philosophy
Daaka, Yehia	Professor	Anatomy and Cell Biology
Daegling, David	Associate Professor	Anthropology
Dahl, Geoffrey	Professor	Animal Sciences
Dahl, Wendy	Assistant Professor	Food Science and Human Nutrition
Dailey, Amy	Assistant Professor	Public Health
Dale, Elizabeth	Associate Professor	History
Dallery, Jesse	Associate Professor	Psychology
Dame, John	Professor	Veterinary Medicine
Dana, Nancy	Professor	Teaching and Learning
Dana, Thomas	Professor	Teaching and Learning
Daniels, Jaret	Assistant Professor	Entomology and Nematology
Daniels, M. Harry	Professor	Human Development and Organizational Studies in Education
Daniels, Michael	Professor	Statistics
Dankel, Douglas	Assistant Professor	Computer and Information Science and Engineering
Danyluk, Michelle	Assistant Professor	Food Science and Human Nutrition
Dark, Michael	Assistant	Veterinary Medicine

	Professor	
Daroub, Samira	Associate Professor	Soil and Water Science
Daunic, Ann	Associate Scholar	Special Education, School Psychology and Early Childhood Studies
Davenport, Paul	Professor	Veterinary Medicine
Davidson, James	Assistant Professor	Anthropology
Davidson, Mark	Research Assistant Scientist	Materials Science and Engineering
Davis, Francis	Associate Professor	Microbiology and Cell Science
Davis, Jack	Associate Professor	History
Davis, John	Associate Professor	Forest Resources and Conservation
Davis, Joyce	Professor	Music
Davis, Michael	Professor	Plant Pathology
Davis, Timothy	Professor	Computer and Information Science and Engineering
Dawson, George	Professor	Comparative Law
Dawson, Kara	Associate Professor	Teaching and Learning
Dawson, William	Eminent Scholar	Plant Pathology
Day, Jane	Clinical Associate Professor	Physical Therapy
Day, Jonathan	Professor	Entomology and Nematology
De Crecy-Lagard, Valerie	Associate Professor	Microbiology and Cell Science
De Jong, Ester	Associate Professor	Teaching and Learning
De Leenheer, Patrick	Associate Professor	Mathematics
De Vries, Albert	Associate Professor	Animal Sciences
Deagan, Kathleen	Distinguished Research Curator	Anthropology
Dean, Robert	Graduate Research Professor	Civil and Coastal Engineering
Dede, Duane	Clinical Professor	Clinical and Health Psychology
Deere, Carmen	Professor	Latin American Studies
Defrance, Susan	Associate Professor	Anthropology
Degner, Janet	Engineer	Civil and Coastal Engineering

Dehoff, Robert	Professor	Materials Science and Engineering
Delfino, Joseph	Professor	Environmental Engineering Sciences
Delp, Michael	Professor	Applied Physiology and Kinesiology
Demarse, Thomas	Research Assistant Scientist	Biomedical Engineering
Demopoulos, Amanda	Courtesy Assistant Professor	Fisheries and Aquatic Sciences
Dempere, Luisa	Associate Engineer	Materials Science and Engineering
Demski, Joel	Eminent Scholar	Accounting
Deng, Zhanao	Associate Professor	Environmental Horticulture
Denney, Maria	Assistant Professor	Special Education, School Psychology and Early Childhood Studies
Dennis, Donn	Professor	Pharmacology and Therapeutics
Denslow, David	Distinguished Service Professor	Economics
Denslow, Nancy	Professor	Biochemistry and Molecular Biology
Derendorf, Hartmut	Distinguished Professor	Pharmaceutics
Dermott, Stanley	Professor	Astronomy
Detweiler, Steven	Professor	Physics
Deumens, Erik	Scientist	Chemistry
Devereux, Richard	Associate Professor	Soil and Water Science
Devidas, Meenakshi	Research Associate Professor	Epidemiology and Health Policy Research
Devine, Darragh	Associate Professor	Psychology
Dewdney, Megan	Assistant Professor	Plant Pathology
Dewitt, Bon	Associate Professor	Forest Resources and Conservation
Deyrup, James	Professor	Chemistry
Dharnidharka, Vikas	Associate Professor	Clinical Investigation (IDP)
Dickinson, Richard	Professor	Chemical Engineering
Dickison, Sheila	Associate Professor	Classics
Dickson, Donald	Professor	Entomology and Nematology
Diehl, David	Assistant	Family, Youth and Community

	Professor	Sciences
Difino, Sharon	Associate Professor	Language, Literature and Culture
Dilger, Hansjoerg	Assistant Professor	Anthropology
Diller, George	Professor	Romance Languages and Literatures
Dilley, Patricia	Professor	Taxation
Dimatteo, Larry	Professor	Management
Dinculeanu, Nicolae	Professor	Mathematics
Ding, Mingzhou	Professor	Biomedical Engineering
Dinopoulos, Elias	Professor	Economics
Ditto, William	Professor	Biomedical Engineering
Dixon, Andrea	Associate Professor	Human Development and Organizational Studies in Education
Dixon, Warren	Associate Professor	Mechanical and Aerospace Engineering
Dobra, Alin	Associate Professor	Computer and Information Science and Engineering
Dobrin, Sidney	Associate Professor	English
Dodd, C. Kenneth	Associate Professor	Wildlife Ecology and Conservation
Dodd, Julie	Professor	Journalism and Communications
Dodd, Lawrence	Eminent Scholar	Political Science
Dodd, Stephen	Professor	Applied Physiology and Kinesiology
Dodd, Virginia	Associate Professor	Health Education and Behavior
Dolbier, William	Professor	Chemistry
Dolce, Calogero	Associate Professor	Dentistry
Donovan, Gerald	Professor	Veterinary Medicine
Dorazio, Robert	Associate Professor	Statistics
Dorman, Steve	Professor	Health Education and Behavior
Dorsey, Alan	Professor	Physics
Dos Santos, Silvio	Assistant Professor	Music
Doss, Hani	Professor	Statistics
Dotson, Cedrick	Assistant Professor	Neuroscience
Dotson, Vonetta	Assistant Professor	Clinical and Health Psychology
Douglas, Elliot	Associate Professor	Materials Science and Engineering
Douglas, Jane	Associate	English

	Professor	
Dowd, Nancy	Professor	Comparative Law
Dranishnikov, Alexander	Distinguished Professor	Mathematics
Driscoll, Daniel	Professor	Molecular Genetics and Microbiology
Drost, Maarten	Professor	Veterinary Medicine
Drummond, Willa	Professor	Physiology and Pharmacology (IDP)
Drummond-Cawthon, Kelly	Associate Professor	Theatre and Dance
Drury, Kenneth	Professor	Physiology and Functional Genomics
Duarte, Carlos	Professor	Fisheries and Aquatic Sciences
Duff, John	Professor	Music
Duff, William	Professor	Oral Biology
Duffy, Ryan	Assistant Professor	Psychology
Dufty, James	Professor	Physics
Duke, Lisa	Associate Professor	Journalism and Communications
Dukes, Michael	Associate Professor	Agricultural and Biological Engineering
Dukes, Walter	Professor	Building Construction
Duncan, Larry	Professor	Entomology and Nematology
Duncan, R.	Professor	Health Services Research, Management, and Policy
Duncan, Stewart	Assistant Professor	Philosophy
Dunn, Ben	Distinguished Professor	Biochemistry and Molecular Biology
Dunn, William	Professor	Anatomy and Cell Biology
Durning, Patricia	Clinical Assistant Professor	Clinical and Health Psychology
Duryea, Mary	Professor	Forest Resources and Conservation
Dyer, James	Professor	Agricultural Education and Communication
Ealy, Alan	Associate Professor	Animal Sciences
Eaverly, Mary Ann	Associate Professor	Classics
Ebel, Robert	Associate Professor	Horticultural Science
Ebrahimi, Fereshteh	Professor	Materials Science and Engineering
Echevarria-Doan, Silvia	Associate Professor	Human Development and Organizational Studies in Education
Edison, Arthur	Professor	Biochemistry and Molecular

		Biology
Edmonds, Lisa	Assistant Professor	Speech, Language and Hearing Sciences
Edwards, Bruce	Professor	Mathematics
Edwards, Glavis	Courtesy Assistant Professor	Entomology and Nematology
Effros, Bonnie	Professor	History
Ehrlich, Paul	Professor	Mathematics
Ehsani, M	Assistant Professor	Agricultural and Biological Engineering
Eikenberry, Stephen	Professor	Astronomy
Eisenberg, Martin	Professor	Mechanical and Aerospace Engineering
Eisenstadt, William	Professor	Electrical and Computer Engineering
El-Shall, Hassan	Associate Professor	Materials Science and Engineering
Elder, Jennifer	Professor	Nursing
Elefteriadou, Ageliki	Professor	Civil and Coastal Engineering
Ellifritt, Duane	Professor	Civil and Coastal Engineering
Elliott, Monica	Professor	Plant Pathology
Ellis, Dorette	Assistant Professor	Pharmacodynamics
Ellis, James	Assistant Professor	Entomology and Nematology
Ellis, Larry	Research Assistant Professor	Soil and Water Science
Ellis, Laura	Associate Professor	Music
Ellis, Ralph	Associate Professor	Civil and Coastal Engineering
Ellison, Gary	Professor	Veterinary Medicine
Elzinga, Donald	Professor Emeritus	Industrial and Systems Engineering
Elzo, Mauricio	Professor	Animal Sciences
Emerson, Robert	Professor	Management
Emery, Kimberly	Associate Professor	English
Emery, Kitty	Associate Curator	Anthropology
Emihovich, Catherine	Professor	Human Development and Organizational Studies in Education
Enholm, Eric	Professor	Chemistry
Entezari, Alireza	Assistant Professor	Computer and Information Science and Engineering
Erenguc, Sahin	Professor	Information Systems and

		Operations Management
Erez, Amir	Associate Professor	Management
Erickson, John	Assistant Professor	Agronomy
Escobedo, Francisco	Assistant Professor	Forest Resources and Conservation
Esenwein, George	Associate Professor	History
Esquivel, Josephine	Associate Professor	Dentistry
Essegbey, James	Assistant Professor	Language, Literature and Culture
Estrada, Amara	Associate Professor	Veterinary Medicine
Estrin, Mitchell	Professor	Music
Evans, Edward	Associate Professor	Food and Resource Economics
Evans, Stephanie	Associate Professor	Women's Studies
Ewel, Katherine	Professor Emeritus	Forest Resources and Conservation
Eyberg, Sheila	Distinguished Professor	Clinical and Health Psychology
Eyler, Fonda	Professor	Psychology
Eyler, John	Professor	Chemistry
Fan, Zhonghui	Associate Professor	Mechanical and Aerospace Engineering
Fang, Yuguang	Professor	Electrical and Computer Engineering
Fang, Zhihui	Professor	Teaching and Learning
Fanucci, Gail	Assistant Professor	Chemistry
Farese, James	Associate Professor	Veterinary Medicine
Farrar, Michael	Associate Professor	Psychology
Favini, Paul	Associate Professor	Theatre and Dance
Fennell, Eileen	Professor Emeritus	Clinical and Health Psychology
Ferguson, Mary Ann	Professor	Journalism and Communications
Ferrell, Jason	Associate Professor	Agronomy
Ferrer, Millie	Professor	Family, Youth and Community Sciences
Field, Richard	Professor	Physics
Fields, Michael	Professor	Animal Sciences
Figueiredo, Renato	Associate Professor	Electrical and Computer Engineering

Fik, Timothy	Associate Professor	Geography
Filip, Hana	Associate Professor	Language, Literature and Culture
Fillingim, Roger	Professor	Dentistry
Finkel, Stuart	Associate Professor	History
Fischler, Ira	Professor	Psychology
Fishel, Frederick	Associate Professor	Agronomy
Fisher, Paul	Associate Professor	Environmental Horticulture
Fishwick, Paul	Professor	Computer and Information Science and Engineering
Fitz, Harold	Assistant Professor	Soil and Water Science
Fitz-Coy, Norman	Associate Professor	Mechanical and Aerospace Engineering
Flanegan, James	Professor	Biochemistry and Molecular Biology
Flannery, Mark	Eminent Scholar	Finance, Insurance and Real Estate
Fletcher, Bradley	Associate Professor	Pharmacology and Therapeutics
Fletcher Jr., Robert	Assistant Professor	Wildlife Ecology and Conservation
Flood, Ian	Associate Professor	Building Construction
Flores-Lagunes, Alfonso	Assistant Professor	Food and Resource Economics
Flournoy, Alyson	Professor	Comparative Law
Flowers, Ralph	Professor	Entomology and Nematology
Focks, Dana	Research Professor	Entomology and Nematology
Fogarty, Kate	Assistant Professor	Family, Youth and Community Sciences
Folimonova, Svetlana	Research Assistant Scientist	Plant Pathology
Foltz, John	Associate Professor Emeritus	Entomology and Nematology
Ford, Eric	Associate Professor	Astronomy
Forder, John	Associate Professor	Biomedical Engineering
Fortes, Jose	Eminent Scholar	Electrical and Computer Engineering
Forthun, Larry	Assistant Professor	Family, Youth and Community Sciences
Fossum, Jerry	Distinguished	Electrical and Computer

	Professor Emeritus	Engineering
Foster, David	Professor	Geological Sciences
Foster, Jamie	Assistant Professor	Microbiology and Cell Science
Foster, Tom	Professor	Neuroscience
Fox, Robert	Associate Professor	Electrical and Computer Engineering
Fraisse, Clyde	Assistant Professor	Agricultural and Biological Engineering
Francis-Floyd, Ruth	Professor	Veterinary Medicine
Frank, J. Howard	Professor	Entomology and Nematology
Frank, Kathryn	Assistant Professor	Urban and Regional Planning
Franks, Bridget	Associate Professor	Human Development and Organizational Studies in Education
Franz, L.	Associate Scientist	Wildlife Ecology and Conservation
Frazer, Nat	Professor	Wildlife Ecology and Conservation
Frazer, Tom	Professor	Fisheries and Aquatic Sciences
Frazier, Charles	Associate Professor	Pharmacodynamics
Frederick, Peter	Research Professor	Wildlife Ecology and Conservation
Freel, Robert	Research Associate Professor	Pathology, Immunology and Laboratory Medicine
Freeman, David	Professor	Veterinary Medicine
Freeman, Natalie	Associate Professor	Public Health
Fregly, Benjamin	Professor	Mechanical and Aerospace Engineering
Freifeld, Alice	Associate Professor	History
Freyre, Rosanna	Research Scientist	Environmental Horticulture
Friedman, William	Professor	Neuroscience
Friel, Michael	Professor	Taxation
Frierson, Henry	Professor	Human Development and Organizational Studies in Education
Frosch, Joan	Professor	Theatre and Dance
Frost, Susan	Professor	Biochemistry and Molecular Biology
Fry, James	Professor	Physics
Frye, Reginald	Associate Professor	Pharmacy
Fu, Danling	Professor	Teaching and Learning

Fuchs, Gerhard	Associate Professor	Materials Science and Engineering
Fukuyama, Mary	Clinical Professor	Psychology
Fuller, David	Associate Professor	Physical Therapy
Funderburk, Joseph	Professor	Entomology and Nematology
Furic, Ivan	Assistant Professor	Physics
Futterknecht, Franz	Professor	Language, Literature and Culture
Gabriel, Dean	Professor	Plant Pathology
Gader, Paul	Professor	Computer and Information Science and Engineering
Gagnon, Joseph	Assistant Professor	Special Education, School Psychology and Early Childhood Studies
Gallman, James	Professor	History
Gallo, Maria	Professor	Agronomy
Galloway, Stacey	Assistant Professor	Theatre and Dance
Gamble, Dovie	Assistant Professor	Tourism, Recreation, and Sport Management
Gao, Bin	Assistant Professor	Agricultural and Biological Engineering
Gao, Zhifeng	Research Assistant Scientist	Food and Resource Economics
Gapenski, Louis	Professor	Health Services Research, Management, and Policy
Garg, Lal	Professor	Pharmacology and Therapeutics
Garland, Christina	Assistant Professor	Theatre and Dance
Garvan, Cynthia	Associate Scholar	Human Development and Organizational Studies in Education
Garvan, Francis	Professor	Mathematics
Gattone, Charles	Associate Professor	Sociology
Ge, Jian	Professor	Astronomy
Geden, Chris	Courtesy Professor	Entomology and Nematology
Geffken, Gary	Associate Professor	Clinical and Health Psychology
Geggus, David	Professor	History
George, Alan	Professor	Electrical and Computer Engineering
George, Steven	Associate Professor	Physical Therapy
Gerberg, Eugene	Courtesy	Entomology and Nematology

	Professor	
Gerhardt, Kenneth	Professor	Speech, Language and Hearing Sciences
Geunes, Joseph	Professor	Industrial and Systems Engineering
Ghiviriga, Ion	Scientist	Chemistry
Ghosh, Malay	Distinguished Professor	Statistics
Gibbs, Edward	Professor	Veterinary Medicine
Giblin-Davis, Robin	Professor	Entomology and Nematology
Gibson, Chris	Assistant Professor	Criminology, Law and Society
Gibson, Heather	Associate Professor	Tourism, Recreation, and Sport Management
Gifford, Gregory	Assistant Professor	Agricultural Education and Communication
Giguere, Steeve	Professor	Veterinary Medicine
Gila, Brent	Research Assistant Scientist	Materials Science and Engineering
Gilbert, Pamela	Professor	English
Gilbert, Robert	Associate Professor	Agronomy
Giles, Geoffrey	Associate Professor	History
Gilland, David	Associate Professor	Nuclear and Radiological Engineering
Gillespie, Susan	Associate Professor	Anthropology
Gillooly, James	Assistant Professor	Biology
Ginway, Mary	Associate Professor	Spanish and Portuguese Studies
Giron, Jorge	Associate Professor	Molecular Genetics and Microbiology
Gitzendanner, Matthew	Associate Scientist	Biology
Giuliano, William	Associate Professor	Wildlife Ecology and Conservation
Gladdys, Katerie	Assistant Professor	Art and Art History
Glagola, Charles	Associate Professor	Civil and Coastal Engineering
Glicksman, Martin	Professor	Materials Science and Engineering
Glover, Joseph	Professor	Mathematics
Goda, Norman	Professor	History
Golant, Stephen	Professor	Geography
Gold, Mark	Eminent Scholar	Neuroscience
Gold, Martin	Associate	Architecture

	Professor	
Goldberg, Eugene	Professor	Materials Science and Engineering
Goldberger, Bruce	Clinical Professor	Pathology, Immunology and Laboratory Medicine
Golde, Todd	Professor	Neuroscience
Goldman, Abraham	Associate Professor	Geography
Golombek, Paula	Clinical Associate Professor	Linguistics
Gonzales-Rothi, Leslie	Professor	Communication Sciences and Disorders
Gonzalez, Anthony	Associate Professor	Astronomy
Gonzalez, Carina	Assistant Professor	Spanish and Portuguese Studies
Gonzalez, Claudio	Assistant Professor	Microbiology and Cell Science
Gonzalez-Rothi, Ricardo	Professor	Pharmacy
Goodenow, Maureen	Professor	Pathology, Immunology and Laboratory Medicine
Goodman, Jennifer	Associate Professor	Journalism and Communications
Goodrich, Renee	Associate Professor	Food Science and Human Nutrition
Goodwin, James	Assistant Professor	Language, Literature and Culture
Goovaerts, Pierre	Associate Professor	Soil and Water Science
Gopalakrishnan, Jay	Professor	Mathematics
Gordan, Valeria	Professor	Dentistry
Gordon, Doria	Professor	Botany
Gordon-Ross, Ann	Assistant Professor	Electrical and Computer Engineering
Gorham, Michael	Associate Professor	Language, Literature and Culture
Gorman, Brian	Assistant Professor	Materials Science and Engineering
Gottwald, Tim	Associate Professor	Plant Pathology
Gower, Laurie	Associate Professor	Materials Science and Engineering
Graber, Julia	Professor	Psychology
Graetz, Donald	Professor	Soil and Water Science
Graham, Elizabeth	Professor	Music
Graham, James	Professor	Soil and Water Science
Graham, Roy	Professor	Architecture
Graham, Wendy	Professor	Agricultural and Biological

		Engineering
Grams, R.	Professor	Pathology, Immunology and Laboratory Medicine
Grant, Maria	Professor	Pharmacology and Therapeutics
Gravlee, Clarence	Associate Professor	Anthropology
Greany, Patrick	Courtesy Professor	Entomology and Nematology
Greenberg, Michael	Professor	Pharmacology and Therapeutics
Greenslet, Hitomi	Associate Professor	Mechanical and Aerospace Engineering
Greger, Debora	Professor	English
Gregg, Andrea	Associate Professor	Nursing
Gregory, Frederick	Professor	History
Gregory, Jesse	Professor	Food Science and Human Nutrition
Grieshaber, Scott	Assistant Professor	Oral Biology
Griffin, Brenda	Associate Professor	Veterinary Medicine
Griffin, Cynthia	Professor	Special Education, School Psychology and Early Childhood Studies
Griffin, Wayne	Clinical Associate Professor	Human Development and Organizational Studies in Education
Griffiths, Scott	Associate Professor	Speech, Language and Hearing Sciences
Grimes, Churchill	Associate Professor	Forest Resources and Conservation
Grist, Robert	Associate Professor	Landscape Architecture
Groisser, David	Associate Professor	Mathematics
Grove, David	Professor	Anthropology
Grunwald, Sabine	Professor	Soil and Water Science
Gu, Liwei	Assistant Professor	Food Science and Human Nutrition
Guan, Yongpei	Assistant Professor	Industrial and Systems Engineering
Guelmann, Marcio	Associate Professor	Dentistry
Guenther, Robert	Clinical Professor	Clinical and Health Psychology
Guillette, Elizabeth	Associate Scientist	Anthropology
Guillette, Louis	Distinguished Professor	Biology
Gulig, Paul	Professor	Molecular Genetics and Microbiology

Gumz, Michelle	Assistant Professor	Biochemistry and Molecular Biology
Gundersen, Martin	Associate Professor	Architecture
Gunderson, Michael	Assistant Professor	Food and Resource Economics
Gunzburger, Margaret	Assistant Professor	Wildlife Ecology and Conservation
Guo, Jing	Associate Professor	Electrical and Computer Engineering
Gupta, Virendra	Professor Emeritus	Entomology and Nematology
Gurley, Kurtis	Associate Professor	Civil and Coastal Engineering
Gurley, William	Professor	Microbiology and Cell Science
Gurucharri, Maria	Associate Professor	Landscape Architecture
Gustafson, Bo	Professor	Astronomy
Gutter, Michael	Assistant Professor	Family, Youth and Community Sciences
Guzman, Rafael	Professor	Astronomy
Gylys, Julius	Clinical Assistant Professor	Clinical and Health Psychology
Habeck, Dale	Professor Emeritus	Entomology and Nematology
Hackett, David	Associate Professor	Religion
Haftka, Raphael	Distinguished Professor	Mechanical and Aerospace Engineering
Hagelin-Weaver, Helena	Research Assistant Professor	Chemical Engineering
Hagen, Stephen	Professor	Physics
Hager, William	Professor	Mathematics
Haghighat, Alireza	Professor	Nuclear and Radiological Engineering
Hahn, Daniel	Assistant Professor	Entomology and Nematology
Hahn, David	Professor	Mechanical and Aerospace Engineering
Hailey, Charles	Associate Professor	Architecture
Hall, Allyson	Associate Professor	Health Services Research, Management, and Policy
Hall, Donald	Professor	Entomology and Nematology
Hall, Harlan	Associate Professor	Entomology and Nematology
Hall, Jay	Clinical Professor	Speech, Language and Hearing Sciences
Haller, William	Professor	Agronomy

Haman, Dorota	Professor	Agricultural and Biological Engineering
Hamann, Fredrick	Professor	Astronomy
Hamersma, Sarah	Assistant Professor	Economics
Hamilton, Homer	Associate Professor	Civil and Coastal Engineering
Hamilton, Jonathan	Professor	Economics
Hammer, Jacob	Professor	Electrical and Computer Engineering
Handfield, Martin	Associate Professor	Dentistry
Handler, Alfred	Assistant Professor	Entomology and Nematology
Hanlon, Edward	Professor	Soil and Water Science
Hansen, Peter	Distinguished Professor	Animal Sciences
Hansen de Chapman, Gail	Assistant Professor	Environmental Horticulture
Hanson, Andrew	Eminent Scholar	Plant Molecular and Cellular Biology
Hanson, Carolyn	Lecturer	Occupational Therapy
Hanson, Stephanie	Clinical Professor	Public Health
Harder, Amy	Assistant Professor	Agricultural Education and Communication
Hardman, Martha	Professor	Anthropology
Harfe, Brian	Associate Professor	Molecular Genetics and Microbiology
Harland-Jacobs, Jessica	Associate Professor	History
Harle, Christopher	Assistant Professor	Health Services Research, Management, and Policy
Harman, Jeffrey	Associate Professor	Health Services Research, Management, and Policy
Harmon, Alice	Professor	Biology
Harmon, Phillip	Associate Professor	Plant Pathology
Harnsberger, James	Assistant Professor	Communication Sciences and Disorders
Harper, Candace	Associate Professor	Teaching and Learning
Harpold, Terry	Associate Professor	English
Harris, John	Professor	Electrical and Computer Engineering
Harris, Willie	Professor	Soil and Water Science
Harrison, Faye	Professor	Anthropology
Harrison, Jeffrey	Professor	Pharmacology and Therapeutics
Harrison, Jeffrey	Professor	Comparative Law

Harrison, Mark	Assistant Professor	Nuclear and Radiological Engineering
Harrison, Nigel	Associate Professor	Plant Pathology
Harrison, Willard	Professor	Chemistry
Hart, Mitchell	Professor	History
Hartigan, Karelisa	Professor Emeritus	Classics
Hartman, Joseph	Professor	Industrial and Systems Engineering
Hartman, Kathleen	Assistant Professor	Fisheries and Aquatic Sciences
Hartzema, Abraham	Eminent Scholar	Pharmaceutical Outcomes and Policy
Harvey, John	Professor	Veterinary Medicine
Hasak-Lowy, Todd	Associate Professor	Language, Literature and Culture
Hasel, Lisa	Assistant Professor	Criminology, Law and Society
Haselbacher, Andreas	Assistant Professor	Mechanical and Aerospace Engineering
Hass, Christopher	Assistant Professor	Applied Physiology and Kinesiology
Hastie, Barbara	Assistant Professor	Dentistry
Hasty, Willard	Professor	Language, Literature and Culture
Hatav, Galia	Associate Professor	Linguistics
Hatch, Marguerite	Associate Professor	Pathology, Immunology and Laboratory Medicine
Hatch, Robert A	Associate Professor	History
Hatfield, Kirk	Professor	Civil and Coastal Engineering
Hausenblas, Heather	Associate Professor	Applied Physiology and Kinesiology
Hauser, Bernard	Associate Professor	Biology
Hauswirth, William	Research Professor	Molecular Genetics and Microbiology
Havens, Karl	Professor	Fisheries and Aquatic Sciences
Hayes, John	Professor	Wildlife Ecology and Conservation
Haynes, Richard	Professor Emeritus	Philosophy
Hays, Clifford	Professor	Civil and Coastal Engineering
Hayward, Linda	Associate Professor	Veterinary Medicine
He, Zhenli	Associate Professor	Soil and Water Science
Heaney, James	Professor	Environmental Engineering

		Sciences
Heaney, Michael	Assistant Professor	Political Science
Heard, Darryl	Associate Professor	Veterinary Medicine
Heaton, Marieta	Professor	Neuroscience
Heaton, Shelley	Clinical Associate Professor	Clinical and Health Psychology
Hebard, Arthur	Distinguished Professor	Physics
Hebblethwaite, Benjamin	Assistant Professor	Language, Literature and Culture
Heckenberger, Michael	Associate Professor	Anthropology
Hedge, David	Professor	Political Science
Hedrick, Tace	Associate Professor	English
Heesacker, Martin	Professor	Psychology
Heft, Marc	Professor	Clinical and Health Psychology
Hegeman, Susan	Associate Professor	English
Heilman, Kenneth	Clinical Professor	Clinical and Health Psychology
Heipp, Richard	Professor	Art and Art History
Helal, Abdelsalam	Professor	Computer and Information Science and Engineering
Heldermon, Coy	Assistant Professor	Anatomy and Cell Biology
Helling, John	Professor	Chemistry
Helmy, Ahmed	Associate Professor	Computer and Information Science and Engineering
Helton, Jonathan	Professor	Music
Hemp, Gene	Professor	Mechanical and Aerospace Engineering
Hendeles, Leslie	Professor	Pharmacy
Hendershot, Marcus	Assistant Professor	Political Science
Henderson, Brent	Assistant Professor	Linguistics
Henretta, John	Professor	Sociology
Hepler, Charles	Distinguished Professor	Pharmaceutical Outcomes and Policy
Heppner, John	Courtesy Assistant Professor	Entomology and Nematology
Hermer-Vazquez, Linda	Assistant Professor	Psychology
Hernandez, Jorge	Professor	Veterinary Medicine
Hernandez-Truyol, Berta	Professor	Comparative Law

Herndon, Jill	Research Associate Professor	Epidemiology and Health Policy Research
Hershfield, Selman	Professor	Physics
Hersom, Matthew	Associate Professor	Animal Sciences
Hiebert, Ernest	Professor	Plant Pathology
Hill, James	Professor	Pharmacology and Therapeutics
Hill, Jeffrey	Assistant Professor	Fisheries and Aquatic Sciences
Hill, Richard	Associate Professor	Veterinary Medicine
Hill, Stephen	Associate Professor	Physics
Hiltunen, Dennis	Associate Professor	Civil and Coastal Engineering
Hintenlang, David	Associate Professor	Nuclear and Radiological Engineering
Hinze, Jimmie	Professor	Building Construction
Hirata, So	Associate Professor	Chemistry
Hirschfeld, Peter	Professor	Physics
Hix, Raymond	Assistant Professor	Entomology and Nematology
Ho, Jeffrey	Assistant Professor	Computer and Information Science and Engineering
Hobert, James	Professor	Statistics
Hochmair, Hartwig	Assistant Professor	Forest Resources and Conservation
Hochmuth, George	Professor	Soil and Water Science
Hochwald, Steven	Associate Professor	Molecular Genetics and Microbiology
Hoctor, Thomas	Associate Scientist	Landscape Architecture
Hodell, David	Professor	Geological Sciences
Hodges, Alan	Extension Scientist	Food and Resource Economics
Hodges, Greg	Assistant Professor	Entomology and Nematology
Hofer, Adeline	Associate Professor	Architecture
Hoffer, Charles	Professor	Music
Hoffman, Paul	Professor	Neuroscience
Hoffmann, Edward	Professor	Microbiology and Cell Science
Hoflund, Gar	Professor	Chemical Engineering
Hofmann, Michael	Lecturer	English
Hogsette, Jerome	Courtesy Professor	Entomology and Nematology
Hoh, Brian	Assistant Professor	Neuroscience
Holland, Stephen	Associate	Tourism, Recreation, and Sport

	Professor	Management
Holliday, Lexie	Associate Professor	Anatomy and Cell Biology
Hollinger, Richard	Professor	Sociology
Holloway, Paul	Distinguished Professor	Materials Science and Engineering
Holmes, Alice	Professor	Speech, Language and Hearing Sciences
Holt, Robert	Eminent Scholar	Biology
Homan Jr, Sidney	Professor	English
Hon, Linda	Professor	Journalism and Communications
Honeyman, David	Professor	Human Development and Organizational Studies in Education
Hong, Sukwon	Assistant Professor	Chemistry
Hopkins, Donald	Professor	Plant Pathology
Horenstein, Nicole	Associate Professor	Chemistry
Horgas, Ann	Associate Professor	Nursing
Hornsby, Arthur	Professor	Soil and Water Science
Horodyski, Marybeth	Professor	Physical Therapy
Hostetler, Mark	Associate Professor	Wildlife Ecology and Conservation
House, Lisa	Professor	Food and Resource Economics
Houston, Joel	Professor	Finance, Insurance and Real Estate
Howland, Dena	Associate Professor	Neuroscience
Hoy, Marjorie	Eminent Scholar	Entomology and Nematology
Hozic, Aida	Associate Professor	Political Science
Hsu, Stephen	Associate Professor	Molecular Genetics and Microbiology
Huang, I-Chan	Assistant Professor	Epidemiology and Health Policy Research
Huang, Suming	Assistant Professor	Biochemistry and Molecular Biology
Hubbard, Michael	Associate Professor	Entomology and Nematology
Huber, Dudley	Associate In	Forest Resources and Conservation
Hudson, David	Professor	Taxation
Huffaker, Ray	Professor	Food and Resource Economics
Hulvey, S	Associate Professor	Language, Literature and Culture

Hummel, R.	Professor	Materials Science and Engineering
Humphrey, Stephen	Curator	Interdisciplinary Ecology
Hurt, Jeff	Associate Professor	Teaching and Learning
Hyde, Melissa	Associate Professor	Art and Art History
Ifju, Peter	Professor	Mechanical and Aerospace Engineering
Ihas, Gary	Professor	Physics
Ingersent, J. Kevin	Professor	Physics
Inglett, Patrick	Assistant Professor	Soil and Water Science
Ingley, Herbert	Associate Professor	Mechanical and Aerospace Engineering
Ingram, Keith	Associate Scientist	Agricultural and Biological Engineering
Ingram, Lonnie	Distinguished Professor	Microbiology and Cell Science
Irani, Tracy	Professor	Agricultural Education and Communication
Irchai, Arnold	Associate Professor	Music
Irsik, Max	Clinical Assistant Professor	Veterinary Medicine
Isaacson, Marcia	Professor	Art and Art History
Isaza, Natalie	Clinical Assistant Professor	Veterinary Medicine
Isaza, Ramiro	Associate Professor	Veterinary Medicine
Isenberg, Sheldon	Associate Professor	Religion
Israel, Glenn	Professor	Agricultural Education and Communication
Issa, R. Raymond	Professor	Building Construction
Iwata, Brian	Professor	Psychology
Jacobbe, Timothy	Assistant Professor	Teaching and Learning
Jacobs, Alan	Professor	Nuclear and Radiological Engineering
Jacobs, Matthew	Assistant Professor	History
Jacobson, Elliott	Professor	Veterinary Medicine
Jacobson, Susan	Professor	Wildlife Ecology and Conservation
Jaeger, John	Associate Professor	Geological Sciences
James, Christophe	Eminent	Finance, Insurance and Real

	Scholar	Estate
James, Delores	Associate Professor	Health Education and Behavior
James, Margaret	Professor	Medicinal Chemistry
Janelle, Christophe	Associate Professor	Applied Physiology and Kinesiology
Jang, Myoseon	Associate Professor	Environmental Engineering Sciences
Janicke, David	Associate Professor	Clinical and Health Psychology
Janiszewski, Chris	Professor	Marketing
Janowich, Ronald	Associate Professor	Art and Art History
Janus, Christopher	Research Assistant Professor	Neuroscience
Jawitz, James	Associate Professor	Soil and Water Science
Jenkins, David	Associate Engineer	Mechanical and Aerospace Engineering
Jennings, Arthur	Professor	Music
Jiang, Huabei	Professor	Biomedical Engineering
Jiang, Peng	Associate Professor	Chemical Engineering
Jimenez, Reynaldo	Associate Professor	Spanish and Portuguese Studies
Jin, Shouguang	Professor	Molecular Genetics and Microbiology
Johns Jr, Lewis	Professor	Chemical Engineering
Johnson, Dalton	Professor	Animal Sciences
Johnson, Edward	Associate Professor	Animal Sciences
Johnson, Freddie	Professor Emeritus	Entomology and Nematology
Johnson, Howard	Graduate Research Professor	Microbiology and Cell Science
Johnson, James	Professor	Clinical and Health Psychology
Johnson, Judith	Research Professor	Pathology, Immunology and Laboratory Medicine
Johnson, Julie	Professor	Pharmacy
Johnson, Richard	Professor	Veterinary Medicine
Johnson, Sally	Associate Professor	Animal Sciences
Johnson, Steve	Associate Professor	Wildlife Ecology and Conservation
Johnson, Suzanne	Professor	Clinical and Health Psychology
Johnson, Timothy	Associate Professor	Classics
Jokela, Eric	Professor	Forest Resources and Conservation

Jones, Douglas	Professor	Geological Sciences
Jones, Hazel	Associate Professor	Special Education, School Psychology and Early Childhood Studies
Jones, Jacob	Assistant Professor	Materials Science and Engineering
Jones, James	Distinguished Professor	Agricultural and Biological Engineering
Jones, Jeffrey	Professor	Plant Pathology
Jones, Kevin	Professor	Materials Science and Engineering
Jones, Linda	Associate Professor	Teaching and Learning
Jones, Pierce	Professor	Agricultural and Biological Engineering
Jordan, Joy	Associate Professor	Family, Youth and Community Sciences
Jose, Shibu	Professor	Forest Resources and Conservation
Jourdan, Dawn	Assistant Professor	Urban and Regional Planning
Joyce, Diana	Associate Scholar	Special Education, School Psychology and Early Childhood Studies
Joyce, Joseph	Professor	Agronomy
Jubien, Michael	Professor	Philosophy
Judd, Walter	Distinguished Professor	Biology
Judge, Jasmeet	Associate Professor	Agricultural and Biological Engineering
Judge, Timothy	Eminent Scholar	Management
Julian, David	Professor	Biology
Jury, Michael	Associate Professor	Mathematics
Kaan, Edith	Associate Professor	Linguistics
Kahveci, Tamer	Associate Professor	Computer and Information Science and Engineering
Kaid, Lynda	Professor	Journalism and Communications
Kainer, Karen	Associate Professor	Forest Resources and Conservation
Kairalla, John	Assistant Professor	Epidemiology and Health Policy Research
Kairo, Moses	Professor	Entomology and Nematology
Kamhawi, Rasha	Assistant Professor	Journalism and Communications
Kammeyer-Mueller, John	Associate Professor	Management
Kane, Abdoulaye	Assistant	Anthropology

	Professor	
Kane, Michael	Professor	Environmental Horticulture
Kang, Byung	Assistant Professor	Microbiology and Cell Science
Kanga, Lambert	Associate Professor	Entomology and Nematology
Kaplan, John	Professor	Journalism and Communications
Kaplanidou, Kyriaki	Assistant Professor	Tourism, Recreation, and Sport Management
Kapparis, Konstantin	Associate Professor	Classics
Kargaltsev, Oleg	Associate Scientist	Astronomy
Karpinia, Katherine	Associate Professor	Dentistry
Kasahara, Hideko	Associate Professor	Physiology and Functional Genomics
Katovich, Michael	Professor	Pharmacodynamics
Katritzky, Alan	Professor	Chemistry
Katz, Joseph	Professor	Dentistry
Kauf, Teresa	Associate Professor	Pharmaceutical Outcomes and Policy
Kaufman, Phillip	Assistant Professor	Entomology and Nematology
Kauwell, Gail	Professor	Food Science and Human Nutrition
Kawashima, Robert	Associate Professor	Religion
Kaye, Frederic	Professor	Genetics and Genomics
Kaye, Stanley	Associate Professor	Theatre and Dance
Keating, Kevin	Associate Professor	Mathematics
Keegan, William	Curator	Anthropology
Keesling, James	Professor	Mathematics
Kehoe, Thomas	Assistant Scientist	Astronomy
Keil, Andreas	Associate Professor	Psychology
Keller-Wood, Maureen	Professor	Pharmacodynamics
Kelly, Kathleen	Professor	Journalism and Communications
Kem, William	Professor	Pharmacology and Therapeutics
Kemple, Kristen	Professor	Special Education, School Psychology and Early Childhood Studies
Kendall, Diane	Assistant Professor	Communication Sciences and Disorders
Kenny, Lawrence	Professor	Economics

Kenworthy, Kevin	Associate Professor	Agronomy
Kerkhoff, Thomas	Clinical Professor	Clinical and Health Psychology
Kershner, R.	Professor	English
Kertes, Darlene	Assistant Professor	Psychology
Keselowsky, Ben	Assistant Professor	Biomedical Engineering
Kesling, Will	Professor	Music
Kessler, Gwynn	Assistant Professor	Religion
Keyhani, Nematolah	Associate Professor	Microbiology and Cell Science
Keys, Eric	Assistant Professor	Geography
Khan, Saeed	Professor	Pathology, Immunology and Laboratory Medicine
Khare, Kshitij	Assistant Professor	Statistics
Khargonekar, Pramod	Professor	Electrical and Computer Engineering
Kibert, Charles	Professor	Building Construction
Kidd, Kenneth	Associate Professor	English
Kiker, Clyde	Professor	Food and Resource Economics
Kiker, Gregory	Assistant Professor	Agricultural and Biological Engineering
Kilberg, Michael	Professor	Biochemistry and Molecular Biology
Kim, Nam Ho	Associate Professor	Mechanical and Aerospace Engineering
Kim, Seong-Hun	Assistant Professor	Pharmacology and Therapeutics
Kima, Peter	Associate Professor	Microbiology and Cell Science
Kimball, Rebecca	Associate Professor	Biology
Kimberlin, Carole	Professor	Pharmaceutical Outcomes and Policy
King, Debra	Professor	English
King, Jonathan	Associate Professor	Mathematics
King, Michael	Research Scientist	Neuroscience
Kiousis, Spiro	Professor	Journalism and Communications
Kirk, Marcus	Assistant Professor	Accounting
Kirkman, Lelia	Associate Scientist	Wildlife Ecology and Conservation

Kirst, Matias	Associate Professor	Forest Resources and Conservation
Kitajima, Kaoru	Associate Professor	Biology
Kitchens, Wiley	Professor	Wildlife Ecology and Conservation
Kladde, Michael	Associate Professor	Biochemistry and Molecular Biology
Klassen, Waldemar	Professor	Entomology and Nematology
Klausner, James	Professor	Mechanical and Aerospace Engineering
Kleespies, Ingrid	Assistant Professor	Language, Literature and Culture
Kleim, Jeffrey	Associate Professor	Neuroscience
Kleiman, Valeria	Associate Professor	Chemistry
Kligerman, Eric	Associate Professor	Language, Literature and Culture
Klimenko, Sergey	Scientist	Physics
Kline, Daniel	Assistant Professor	Entomology and Nematology
Kline, Wesley	Assistant Professor	Art and Art History
Klodell, Charles	Associate Professor	Biomedical Engineering
Knechel, W. Robert	Professor	Accounting
Kneipp, Shawn	Associate Professor	Nursing
Knudson, Kevin	Professor	Mathematics
Knutson, Mitchell	Associate Professor	Food Science and Human Nutrition
Ko, Yong	Associate Professor	Tourism, Recreation, and Sport Management
Kobziar, Leda	Assistant Professor	Forest Resources and Conservation
Koehler, Gary	Eminent Scholar	Information Systems and Operations Management
Koehler, Philip	Professor	Entomology and Nematology
Kohen, Martha	Professor	Architecture
Komro, Kelli	Professor	Epidemiology and Health Policy Research
Konigsberg, Jacobo	Scientist	Physics
Koonawootrittriron, Skorn	Assistant Professor	Animal Sciences
Koonce, Paul	Professor	Music
Koopman, Ben	Professor	Environmental Engineering Sciences
Kopelevich, Dmitry	Associate Professor	Chemical Engineering

Koro-Ljungberg, Mirka	Associate Professor	Human Development and Organizational Studies in Education
Koroly, Mary	Associate Scientist	Biochemistry and Molecular Biology
Koropeckyj-Cox, Tanya	Associate Professor	Sociology
Korytov, Andrey	Professor	Physics
Kostadinova, Petia	Assistant Professor	Political Science
Kovner, Sarah	Assistant Professor	History
Kraft, John	Professor	Finance, Insurance and Real Estate
Kramer, Sandra	Associate Professor	Accounting
Kranzler, John	Professor	Special Education, School Psychology and Early Childhood Studies
Krauthammer, Theodor	Professor	Civil and Coastal Engineering
Kreppel, Amie	Associate Professor	Political Science
Kricos, Patricia	Professor	Speech, Language and Hearing Sciences
Krigbaum, John	Associate Professor	Anthropology
Kristinsson, Hordur	Associate Professor	Food Science and Human Nutrition
Kroen, Sheryl	Associate Professor	History
Krohn, Marvin	Professor	Criminology, Law and Society
Krueger, Charlene	Associate Professor	Nursing
Kruse, Jason	Assistant Professor	Environmental Horticulture
Krysko, Kenneth	Assistant Scientist	Wildlife Ecology and Conservation
Kucharek, Thomas	Professor	Plant Pathology
Kuenstle, Michael	Associate Professor	Architecture
Kugelmass, Jack	Professor	Anthropology
Kumar, Ashok	Research Assistant Professor	Neuroscience
Kumar, Ashok	Associate Professor	Mechanical and Aerospace Engineering
Kumar, Pradeep	Professor	Physics
Kumaran, Muthusami	Assistant Professor	Family, Youth and Community Sciences
Kunz, Thomas	Professor	Wildlife Ecology and

		Conservation
Kurtz, James	Research Engineer	Electrical and Computer Engineering
Kusmartsev, Sergei	Assistant Professor	Anatomy and Cell Biology
Kwolek-Folland, Angel	Professor	History
Labisky, Ronald	Professor	Wildlife Ecology and Conservation
Lada, Elizabeth	Professor	Astronomy
Ladd, Anthony	Professor	Chemical Engineering
Lai, Guolong	Assistant Professor	Art and Art History
Laipis, Philip	Professor	Biochemistry and Molecular Biology
Lake, Lauren	Associate Professor	Art and Art History
Lam, Herman	Associate Professor	Electrical and Computer Engineering
Lamb, Graham	Professor	Animal Sciences
Lamme, Ary	Associate Professor	Geography
Lamont, Richard	Professor	Oral Biology
Lampotang, Samsun	Professor	Electrical and Computer Engineering
Lan, Guanghui	Assistant Professor	Industrial and Systems Engineering
Lane, Holly	Associate Professor	Special Education, School Psychology and Early Childhood Studies
Lane, Jodi	Associate Professor	Sociology
Lane, Michael	Research Assistant Professor	Neuroscience
Lang, Peter	Graduate Research Professor	Clinical and Health Psychology
Langeland, Kenneth	Professor	Agronomy
Langkamp-Henken, Bobbi	Professor	Food Science and Human Nutrition
Langwick, Stacey	Assistant Professor	Anthropology
Lanza-Kaduce, Lonn	Professor	Sociology
Larkin, Iske	Research Assistant Professor	Veterinary Medicine
Larkin, Sherry	Associate Professor	Food and Resource Economics

Larkin III, Joseph	Assistant Professor	Microbiology and Cell Science
Larsen, Kristin	Associate Professor	Urban and Regional Planning
Larson, Jean	Professor	Mathematics
Latchman, Haniph	Professor	Electrical and Computer Engineering
Law, Brian	Assistant Professor	Pharmacology and Therapeutics
Law, Mark	Professor	Electrical and Computer Engineering
Law, Mary	Research Assistant Professor	Pharmacology and Therapeutics
Lawphongpanich, Siriphong	Associate Professor	Industrial and Systems Engineering
Lawrence, Pauline	Professor	Entomology and Nematology
Laywell, Eric	Assistant Professor	Anatomy and Cell Biology
Lear, William	Associate Professor	Mechanical and Aerospace Engineering
Leary, James	Senior Lecturer	Agricultural and Biological Engineering
Leavey, John	Professor	English
Leavitt, David	Professor	English
Leber, Kenneth	Professor	Fisheries and Aquatic Sciences
Leblanc, Michelle	Courtesy Associate Professor	Veterinary Medicine
LeBoeuf, Robyn	Associate Professor	Marketing
Lee, Gwendolyn	Assistant Professor	Management
Lee, Jong-Ying	Professor	Food and Resource Economics
Lee, Moon	Associate Professor	Journalism and Communications
Lee, Won Suk	Associate Professor	Agricultural and Biological Engineering
Lee, Yoonseok	Associate Professor	Physics
Leeuwenburgh, Christiaan	Professor	Biochemistry and Molecular Biology (IDP)
Lefebvre, Lynn	Assistant Professor	Wildlife Ecology and Conservation
Legard, Daniel	Associate Professor	Plant Pathology
Lehtola, Carol	Associate Professor	Agricultural and Biological Engineering
Leibee, Gary	Associate Professor	Entomology and Nematology
Leite, Walter	Assistant	Human Development and

	Professor	Organizational Studies in Education
Lele, Tanmay	Assistant Professor	Chemical Engineering
Leonard, Christiana	Professor Emeritus	Neuroscience
LePine, Jeffrey	Professor	Management
Leppla, Norman	Professor	Entomology and Nematology
Leprell, Colleen	Associate Professor	Speech, Language and Hearing Sciences
Leslie, Michael	Associate Professor	Journalism and Communications
Leverty, Lynn	Senior Lecturer	Political Science
Levett, Lora	Assistant Professor	Criminology, Law and Society
Levey, Douglas	Professor	Biology
Levy, Charles	Associate Professor	Physical Therapy
Levy, Julie	Professor	Veterinary Medicine
Lewin, Alfred	Professor	Molecular Genetics and Microbiology
Lewis, Daniel	Eminent Scholar	Veterinary Medicine
Lewis, Mark	Professor	Neuroscience
Lewis, Norman	Assistant Professor	Journalism and Communications
Li, Jian	Professor	Electrical and Computer Engineering
Li, Sheng	Professor	Electrical and Computer Engineering
Li, Tao	Associate Professor	Electrical and Computer Engineering
Li, Yuncong	Professor	Soil and Water Science
Liao, Daiqing	Associate Professor	Anatomy and Cell Biology
Liao, James	Assistant Professor	Botany
Liburd, Oscar	Associate Professor	Entomology and Nematology
Lidsky, Lyrissa	Professor	Law
Light, Kathy	Associate Professor	Physical Therapy
Lillywhite, Harvey	Professor	Biology
Limacher, Marian	Professor	Physiology and Functional Genomics
Lin, Jenshan	Professor	Electrical and Computer Engineering
Lind, Richard	Associate Professor	Mechanical and Aerospace Engineering
Lindberg, Staffan	Associate Professor	Political Science

Lindberg, William	Associate Professor	Fisheries and Aquatic Sciences
Linderholm, Tracy	Associate Professor	Human Development and Organizational Studies in Education
Lindner, Angela	Associate Professor	Environmental Engineering Sciences
Ling, David	Professor	Finance, Insurance and Real Estate
Link, William	Eminent Scholar	History
Linscott, Lester	Associate Professor	Landscape Architecture
Linser, Paul	Professor	Anatomy and Cell Biology
Lipowski, Earlene	Professor	Pharmaceutical Outcomes and Policy
Littell, Ramon	Professor	Statistics
Liu, Bin	Associate Professor	Pharmacodynamics
Liu, Chen	Associate Professor	Pathology, Immunology and Laboratory Medicine
Liu, Chien-Lian	Associate Professor	Computer and Information Science and Engineering
Liu, Chihray	Professor	Nuclear and Radiological Engineering
Liu, Chuang	Professor	Philosophy
Liu, Yijun	Associate Professor	Neuroscience
Livingston, Miles	Professor	Finance, Insurance and Real Estate
Lloyd, James	Visiting Lecturer	Entomology and Nematology
Lobinske, Richard	Courtesy Assistant Professor	Entomology and Nematology
Logan, Kenneth	Associate Professor	Speech, Language and Hearing Sciences
Logan, William	Professor	English
Loimeier, Roman	Assistant Professor	Religion
Lok, Benjamin	Associate Professor	Computer and Information Science and Engineering
Lombardino, Linda	Professor	Communication Sciences and Disorders
Long, Alan	Professor	Forest Resources and Conservation
Long, Joanna	Associate Professor	Biochemistry and Molecular Biology
Long, Kathleen	Professor	Nursing
Long, Maureen	Associate Professor	Veterinary Medicine

Lorca, Graciela	Assistant Professor	Microbiology and Cell Science
Lord, Cynthia	Associate Professor	Entomology and Nematology
Lord, Gillian	Associate Professor	Spanish and Portuguese Studies
Lottenberg, Richard	Professor	Biochemistry and Molecular Biology
Lounibos, Leon	Professor	Entomology and Nematology
Louthan, Howard	Professor	History
Low, Samuel	Professor	Dentistry
Lower, Janna	Professor	Music
Lowery, Ruth	Associate Professor	Teaching and Learning
Lu, Jianrong	Assistant Professor	Biochemistry and Molecular Biology
Lucas, Alexandra	Professor	Molecular Genetics and Microbiology
Luesch, Hendrik	Associate Professor	Medicinal Chemistry
Luke, Charlene	Associate Professor	Taxation
Lutz, Barbara	Associate Professor	Nursing
Lutz, Richard	Professor	Marketing
Lybas, John	Associate Professor	Civil and Coastal Engineering
Ma, Lena	Professor	Soil and Water Science
MacDonald, Greg	Professor	Agronomy
Macedo, Joseli	Assistant Professor	Urban and Regional Planning
Mack, Michelle	Associate Professor	Biology
Mackay, Robert	Professor	Veterinary Medicine
Mackay, Wayne	Professor	Environmental Horticulture
Mackowiak, Cheryl	Associate Professor	Soil and Water Science
Macpherson, Margo	Associate Professor	Veterinary Medicine
Macrae, Andrew	Assistant Professor	Horticultural Science
Maden, Malcolm	Professor	Biology
Magnarella, Paul	Professor	Anthropology
Magnusson, N.	Professor	Oral Biology
Mai, Volker	Assistant Professor	Microbiology and Cell Science
Main, Kevan	Assistant Professor	Fisheries and Aquatic Sciences
Main, Martin	Professor	Wildlife Ecology and Conservation
Mair, Bernard	Professor	Mathematics

Maldonado-Molina, Mildred	Assistant Professor	Epidemiology and Health Policy Research
Malecki, Edward	Professor	Geography
Manchester, Steven	Curator	Botany
Mandel, Ronald	Professor	Neuroscience
Manini, Todd	Assistant Professor	Applied Physiology and Kinesiology
Mann, Giselle	Associate Professor	Public Health
Mann, William	Distinguished Professor	Occupational Therapy
Mannion, Catharine	Associate Professor	Entomology and Nematology
Mansell, Robert	Professor	Soil and Water Science
Mareci, Thomas	Professor	Biochemistry and Molecular Biology
Margheritis, Ana	Assistant Professor	Political Science
Maria, Bernard	Professor	Neuroscience
Marinescu, Marian	Assistant Professor	Forest Resources and Conservation
Marois, James	Professor	Plant Pathology
Marquardt, William	Curator	Anthropology
Marsella, Rosanna	Professor	Veterinary Medicine
Marshall, Kevin	Professor	Theatre and Dance
Marshall, Maurice	Professor	Food Science and Human Nutrition
Marsiglio, William	Professor	Sociology
Marsiske, Michael	Associate Professor	Psychology
Martcheva-Drashanska, Maia	Associate Professor	Mathematics
Martin, Anatole	Professor	Physical Therapy
Martin, Charles	Distinguished Professor	Chemistry
Martin, Ellen	Professor	Geological Sciences
Martin, Jonathan	Professor	Geological Sciences
Martin, Julien	Assistant Professor	Wildlife Ecology and Conservation
Martin, Timothy	Professor	Forest Resources and Conservation
Martinez, Christopher	Assistant Professor	Agricultural and Biological Engineering
Martinez, Jorge	Professor	Mathematics
Martinez, Michael	Professor	Political Science
Maruniak, James	Associate Professor	Entomology and Nematology
Maslov, Dmitrii	Professor	Physics
Mason, Doran	Associate Professor	Fisheries and Aquatic Sciences

Masters, Forrest	Assistant Professor	Civil and Coastal Engineering
Mata, Tony	Associate Professor	Theatre and Dance
Matchev, Konstantin	Associate Professor	Physics
Matcheva, Katia	Assistant Professor	Physics
Matheny, Albert	Professor	Political Science
Mathews, Anne	Research Assistant Scientist	Food Science and Human Nutrition
Mathews, Clayton	Associate Professor	Pathology, Immunology and Laboratory Medicine
Matondo, Masangu	Assistant Professor	Language, Literature and Culture
Matthews, Janet	Assistant Scientist	Historic Preservation
Matyas, Corene	Assistant Professor	Geography
Mauderli, Andre	Associate Professor	Neuroscience
Maupin, Julie	Professor	Microbiology and Cell Science
Maurer, Virginia	Professor	Management
May, William	Professor	Anatomy and Cell Biology
Mayer, Brian	Assistant Professor	Sociology
Maze, John	Associate Professor	Architecture
Mazyck, David	Associate Professor	Environmental Engineering Sciences
Mazzotti, Frank	Associate Professor	Wildlife Ecology and Conservation
McAdams, Melinda	Professor	Journalism and Communications
McAuslane, Heather	Professor	Entomology and Nematology
McBride, Richard	Scientist	Fisheries and Aquatic Sciences
McCarty, Christopher	Associate Professor	Anthropology
McClaurin, Irma	Associate Professor	Anthropology
McCollough, William	Professor	Finance, Insurance and Real Estate
McCormack, Wayne	Associate Professor	Pathology, Immunology and Laboratory Medicine
McCrae, Christina	Associate Professor	Clinical and Health Psychology
Mccray, Erica	Assistant Professor	Special Education, School Psychology and Early Childhood Studies

McCray, James	Assistant Scientist	Agronomy
McCrea, Brian	Professor	English
McCullough, Scott	Professor	Mathematics
McDade, Barbara	Associate Professor	Geography
McDaniel, Stuart	Assistant Professor	Biology
McDowell, Lee	Professor	Animal Sciences
McElwee-White, Lisa	Professor	Chemistry
McFadden, Grant	Professor	Molecular Genetics and Microbiology
McFetridge, Peter	Assistant Professor	Biomedical Engineering
McGill, Gary	Professor	Accounting
McGlothlin, Donald	Professor	Music
McGlothlin, Mark	Assistant Professor	Architecture
McGorray, Susan	Research Assistant Professor	Epidemiology and Health Policy Research
McGovern, Robert	Professor	Plant Pathology
McIndoe, Richard	Assistant Professor	Pathology, Immunology and Laboratory Medicine
McIntyre, Lauren	Associate Professor	Molecular Genetics and Microbiology
McKay, Niccie	Associate Professor	Health Services Research, Management, and Policy
McKenna, Robert	Professor	Biochemistry and Molecular Biology
McKnight, Stephen	Professor	History
McLaughlin, Fiona	Associate Professor	Language, Literature and Culture
McLeskey, James	Professor	Special Education, School Psychology and Early Childhood Studies
McMahon Jr., Martin	Professor	Taxation
McMillan, Della	Assistant Scientist	Anthropology
McMillan Jr, Robert	Professor	Plant Pathology
McNair, Janise	Associate Professor	Electrical and Computer Engineering
McSorley, Robert	Professor	Entomology and Nematology
McVay, Michael	Professor	Civil and Coastal Engineering
Meagher, Robert	Courtesy Assistant Professor	Entomology and Nematology
Mecholsky, John	Professor	Materials Science and Engineering

Meert, Joseph	Associate Professor	Geological Sciences
Mei, Renwei	Professor	Mechanical and Aerospace Engineering
Meier-Kriesche, Herwig-Ulf	Professor	Medicine
Meisel, Mark	Professor	Physics
Meldrum, Michael	Associate Professor	Pharmacodynamics
Melker, Richard	Professor	Biomedical Engineering
Mendenhall, Nancy	Professor	Nuclear and Radiological Engineering
Mendoza, Maria	Assistant Professor	Human Development and Organizational Studies in Education
Meneely, Jason	Assistant Professor	Interior Design
Meng, Ying	Assistant Professor	Materials Science and Engineering
Mennel, Barbara	Associate Professor	Language, Literature and Culture
Merck, Melinda	Assistant Professor	Veterinary Medicine
Mergia, Ayalew	Professor	Veterinary Medicine
Merz, Kenneth	Professor	Chemistry
Meyer, Edwin	Associate Professor	Pharmacology and Therapeutics
Meyer, Kenneth	Associate Professor	Wildlife Ecology and Conservation
Migliaccio, Kati	Associate Professor	Agricultural and Biological Engineering
Mikolaitis, David	Associate Professor	Mechanical and Aerospace Engineering
Milanich, Jerald	Professor	Anthropology
Milbrath, Susan	Curator	Anthropology
Miles, Richard	Professor	Animal Sciences
Millard, William	Professor	Pharmacodynamics
Miller, Christine	Research Assistant Scientist	Entomology and Nematology
Miller, Cleve	Professor	Taxation
Miller, Deborah	Associate Professor	Wildlife Ecology and Conservation
Miller, M	Professor	Human Development and Organizational Studies in Education
Miller, Richard	Associate Professor	Pharmacology and Therapeutics
Miller, Stephen	Associate Professor	Chemistry
Miller, Thomas	Professor	Forest Resources and

		Conservation
Milner, Rowan	Associate Professor	Veterinary Medicine
Min, Kyoungwon	Assistant Professor	Geological Sciences
Minchin, Robert	Associate Professor	Building Construction
Minogue, Patrick	Assistant Professor	Forest Resources and Conservation
Mishra, Prabhat	Associate Professor	Computer and Information Science and Engineering
Mislevy, Paul	Professor	Agronomy
Mitchell, Charlie	Assistant Professor	Theatre and Dance
Mitchell, William	Professor	Mathematics
Mitra, Debanjan	Assistant Professor	Marketing
Mitselmakher, Gena	Distinguished Professor	Physics
Miwa, Masato	Assistant Scientist	Forest Resources and Conservation
Miyamoto, Michael	Professor	Biology
Mizell, Russell	Professor	Entomology and Nematology
Mohamed, Ahmed	Assistant Professor	Forest Resources and Conservation
Molleda, Juan Carlos	Associate Professor	Journalism and Communications
Momol, Timur	Professor	Plant Pathology
Monaghan, Paul	Assistant Professor	Agricultural Education and Communication
Monroe, Martha	Professor	Forest Resources and Conservation
Moore, John	Professor	Anthropology
Moore, Robert	Assistant Professor	Electrical and Computer Engineering
Moradi, Banafsheh	Associate Professor	Psychology
Moraski, Bryon	Associate Professor	Political Science
Morel, Laurence	Professor	Pathology, Immunology and Laboratory Medicine
Morgan, James	Professor	Psychology
Morgan, Kelly	Associate Professor	Soil and Water Science
Moroz, Leonid	Professor	Neuroscience
Morris, John	Professor	Public Health
Morris, Jon	Professor	Journalism and Communications
Morris-Wiman, Joyce	Research Assistant Professor	Dentistry

Morrisroe, Julia	Associate Professor	Art and Art History
Mortensen, Christopher	Assistant Professor	Animal Sciences
Morton, Allison	Clinical Assistant Professor	Veterinary Medicine
Morton, Cynthia	Associate Professor	Journalism and Communications
Moseley, Michael	Distinguished Service Professor	Anthropology
Moss, Charles	Professor	Food and Resource Economics
Mossa, Joann	Associate Professor	Geography
Motz, Louis	Associate Professor	Civil and Coastal Engineering
Mou, Zhonglin	Assistant Professor	Microbiology and Cell Science
Moudgil, Brij	Distinguished Professor	Materials Science and Engineering
Moullier, Philippe	Professor	Molecular Genetics and Microbiology
Moulton, Michael	Associate Professor	Wildlife Ecology and Conservation
Mueller, James	Associate Professor	Religion
Mueller, Paul	Professor	Geological Sciences
Mueller, Robert	Associate Professor	Art and Art History
Muir, Andrew	Clinical Associate Professor	Pathology, Immunology and Laboratory Medicine
Muir, Dave	Professor	Neuroscience
Mullahey, John	Professor	Wildlife Ecology and Conservation
Muller, Guido	Associate Professor	Physics
Muller, Keith	Professor	Epidemiology and Health Policy Research
Muller Delp, Judy	Associate Professor	Physiology and Functional Genomics
Mulligan, Connie	Professor	Anthropology
Munoz-Carpena, Rafael	Associate Professor	Agricultural and Biological Engineering
Murie, Debra	Associate Professor	Fisheries and Aquatic Sciences
Murphy, Carol	Professor	Language, Literature and Culture
Murphy, Joseph	Associate Professor	Language, Literature and Culture

Murray, Gerald	Associate Professor	Anthropology
Muszynski, Larry	Associate Professor	Building Construction
Muttalib, Khandker	Professor	Physics
Muzyczka, Nicholas	Eminent Scholar	Molecular Genetics and Microbiology
Myer, Robert	Professor	Animal Sciences
Myers, Brian	Associate Professor	Agricultural Education and Communication
Myers, Michele	Assistant Professor	Materials Science and Engineering
Mylavarapu, Rao	Associate Professor	Soil and Water Science
Nagan, Winston	Professor	Comparative Law
Nagy, Rebecca	Lecturer	Art and Art History
Nair, Madhu	Associate Professor	Dentistry
Nair, Ramachandr	Distinguished Professor	Forest Resources and Conservation
Nair, Uma	Assistant Professor	Dentistry
Nair, Vimala	Research Professor	Soil and Water Science
Najafi, Fazil	Professor	Civil and Coastal Engineering
Narayan, Satya	Professor	Anatomy and Cell Biology
Narayanan, Ranganathan	Professor	Chemical Engineering
Narayanan, Vasudha	Distinguished Professor	Religion
Nation, James	Professor Emeritus	Entomology and Nematology
Nawari, Nawari	Assistant Professor	Architecture
Needell, Jeffrey	Professor	History
Neff, Donna	Assistant Professor	Nursing
Neimeyer, Greg	Professor	Psychology
Netherland, Michael	Associate Professor	Agronomy
Neugroschel, Arnost	Professor Emeritus	Electrical and Computer Engineering
Nevill Jr, Gale	Professor	Mechanical and Aerospace Engineering
Newman, Jana	Assistant Professor	Soil and Water Science
Newman, Louise	Associate Professor	History
Newman, Richard	Assistant Professor	Computer and Information Science and Engineering
Newman, Susan	Assistant	Soil and Water Science

	Professor	
Newman, Yoana	Assistant Professor	Agronomy
Nguyen, Ru	Assistant Professor	Entomology and Nematology
Niblett, Charles	Professor	Plant Pathology
Nichols, Geraldine	Professor	Spanish and Portuguese Studies
Nichols, James	Professor	Wildlife Ecology and Conservation
Nichols, Wilmer	Professor	Physiology and Functional Genomics
Nicholson, Wayne	Professor	Microbiology and Cell Science
Nick, Harry	Professor	Biochemistry and Molecular Biology
Nickerson, Max	Curator	Wildlife Ecology and Conservation
Nicoletti, Paul	Professor	Veterinary Medicine
Nimalendran, Mahendrara	Professor	Finance, Insurance and Real Estate
Nimmo, Arthur	Professor	Dentistry
Nino, Juan	Associate Professor	Materials Science and Engineering
Nishida, Toshikazu	Professor	Electrical and Computer Engineering
Nkedi-Kizza, Peter	Professor	Soil and Water Science
Noling, Joseph	Professor	Entomology and Nematology
Nollens, Hendrik	Research Assistant Professor	Veterinary Medicine
Noonan, John	Associate Professor	Classics
Nordstedt, Roger	Professor	Agricultural and Biological Engineering
Norman, David	Associate Professor	Plant Pathology
Norman, Marilyn	Associate Professor	Family, Youth and Community Sciences
Norton, David	Professor	Materials Science and Engineering
Notterpek, Lucia	Professor	Neuroscience
Nuessly, Gregg	Associate Professor	Entomology and Nematology
Nye, David	Professor	Finance, Insurance and Real Estate
Nygren, Scott	Professor	English
O, Kenneth	Professor	Electrical and Computer Engineering
O'Brien, Charles	Courtesy Associate Professor	Entomology and Nematology

O'Brien, Susan	Assistant Professor	History
O'Brien, Thomas	Professor	Biochemistry and Molecular Biology
O'Connor, George	Professor	Soil and Water Science
O'Dwyer, Conor	Associate Professor	Political Science
O'Neill, Daniel	Associate Professor	Political Science
Obannon, John	Courtesy Professor	Entomology and Nematology
Ober, Holly	Assistant Professor	Wildlife Ecology and Conservation
Oberlander, Herbert	Courtesy Professor	Entomology and Nematology
Obonyo, Esther	Assistant Professor	Building Construction
Obreza, Thomas	Professor	Soil and Water Science
Obukhov, Sergei	Professor	Physics
Ochi, Michel	Professor	Civil and Coastal Engineering
Odom, Leslie	Associate Professor	Music
Offerle, Frank	Assistant Professor	Music
Ogle, William	Assistant Professor	Biomedical Engineering
Ogram, Andrew	Professor	Soil and Water Science
Oh, Suk	Associate Professor	Physiology and Functional Genomics
Ohrn, Nils	Professor	Chemistry
Oi, David	Assistant Professor	Entomology and Nematology
Oi, Faith	Assistant Extension Scientist	Entomology and Nematology
Olbina, Svetlana	Assistant Professor	Building Construction
Olexa, Michael	Professor	Food and Resource Economics
Oli, Madan	Professor	Wildlife Ecology and Conservation
Oliver, Bernard	Professor	Human Development and Organizational Studies in Education
Oliver, Eileen	Professor	Teaching and Learning
Oliver Smith, Anthony	Professor	Anthropology
Oliverio, James	Professor	Music
Olmstead, James	Assistant Professor	Horticultural Science
Olmstead, Mercy	Assistant Professor	Horticultural Science

Olson, Timothy	Professor	Animal Sciences
Olson, Timothy	Associate Professor	Mathematics
Omenetto, Nicolo	Professor	Chemistry
Ongiri, Amy	Associate Professor	English
Opdyke, Neil	Distinguished Professor	Geological Sciences
Oppenheim, Paul	Professor	Building Construction
Oppenheimer, David	Associate Professor	Biology
Opsahl, Stephen	Assistant Professor	Soil and Water Science
Orazem, Mark	Professor	Chemical Engineering
Oren, Ido	Associate Professor	Political Science
Ormerod, Brandi	Assistant Professor	Biomedical Engineering
Orr, Kevin	Associate Professor	Music
Ortiz, Paul	Associate Professor	History
Osborne, Edward	Professor	Agricultural Education and Communication
Osborne, Lance	Professor	Entomology and Nematology
Osborne, Todd	Research Assistant Professor	Soil and Water Science
Osenberg, Craig	Professor	Biology
Ostroff, David	Professor	Journalism and Communications
Ostrov, David	Associate Professor	Pathology, Immunology and Laboratory Medicine
Otwell, Walter	Professor	Food Science and Human Nutrition
Ou, Li-Tse	Scientist	Soil and Water Science
Ouyang, Ying	Courtesy Assistant Professor	Soil and Water Science
Overdevest, Christine	Assistant Professor	Sociology
Overholt, William	Associate Professor	Entomology and Nematology
Overman, Allen	Professor	Agricultural and Biological Engineering
Oyuela-Caycedo, Augusto	Assistant Professor	Anthropology
Ozores-Hampton, Monica	Assistant Professor	Horticultural Science
Pablo, Luisito	Associate Professor	Veterinary Medicine

Pace, Barbara	Associate Professor	Teaching and Learning
Packer, Colleen	Associate Professor	Teaching and Learning
Packham, Christophe	Associate Scientist	Astronomy
Padhye, Sonali	Assistant Professor	Environmental Horticulture
Padua, Mary	Associate Professor	Landscape Architecture
Pagan-Wolpert, Victoria	Professor	Classics
Page, Judith	Professor	English
Pahor, Marco	Professor	Epidemiology (MD/PH Doctorate)
Palmateer, Aaron	Assistant Professor	Plant Pathology
Palmer, John	Associate Professor	Philosophy
Palmer, Todd	Assistant Professor	Biology
Palmieri, Anthony	Clinical Assistant Professor	Pharmaceutics
Palta, Jatinder	Professor	Nuclear and Radiological Engineering
Panning, Mark	Assistant Professor	Geological Sciences
Pape, Stephen	Associate Professor	Teaching and Learning
Papke, Roger	Professor	Pharmacology and Therapeutics
Pardalos, Panagote	Distinguished Professor	Industrial and Systems Engineering
Park, Chang-Won	Professor	Chemical Engineering
Park, Hyun-Woo	Courtesy Assistant Professor	Entomology and Nematology
Park, Nam-Kyu	Assistant Professor	Interior Design
Park, Trevor	Assistant Professor	Statistics
Park Brown, Sydney	Associate Extension Professor	Environmental Horticulture
Parkyn, Daryl	Research Associate Professor	Fisheries and Aquatic Sciences
Paruchuri, Srikanth	Associate Professor	Management
Patel, Jawaharlal	Professor	Pharmacology and Therapeutics
Pathak, Praveen	Associate	Information Systems and

	Professor	Operations Management
Patterson, Richard	Professor	Entomology and Nematology
Paul, Anand	Associate Professor	Information Systems and Operations Management
Paul, Anna-Lisa	Research Associate Professor	Horticultural Science
Paxson, James	Associate Professor	English
Pearton, Stephen	Distinguished Professor	Materials Science and Engineering
Peck, Ammon	Professor	Pathology, Immunology and Laboratory Medicine
Peek, Charles	Associate Professor	Sociology
Peir, Jih-Kwon	Associate Professor	Computer and Information Science and Engineering
Pena, Jorge	Professor	Entomology and Nematology
Pena, Milagros	Professor	Sociology
Peng, Zhong-ren	Professor	Urban and Regional Planning
Pennington-Gray, Lori	Associate Professor	Tourism, Recreation, and Sport Management
Peoples-Sheps, Mary	Associate Professor	Public Health
Percival, Henry	Associate Professor	Wildlife Ecology and Conservation
Percival, Susan	Professor	Food Science and Human Nutrition
Pereira, Deidre	Assistant Professor	Clinical and Health Psychology
Pereira, Roberto	Research Associate Scientist	Entomology and Nematology
Peres, Natalia	Associate Professor	Plant Pathology
Perez, Hector	Assistant Professor	Environmental Horticulture
Perez-Mendez, Alfonso	Professor	Architecture
Perfit, Michael	Professor	Geological Sciences
Peris, Joanna	Associate Professor	Pharmacodynamics
Perkins, Peter	Professor	Entomology and Nematology
Perlstein, William	Associate Professor	Clinical and Health Psychology
Pernezny, Kenneth	Professor	Plant Pathology
Perri, Michael	Professor	Clinical and Health Psychology
Perrone, Charles	Professor	Spanish and Portuguese Studies
Perry, Scott	Professor	Materials Science and Engineering

Perz, Stephen	Associate Professor	Sociology
Pescador, Manuel	Professor	Entomology and Nematology
Peter, Gary	Associate Professor	Forest Resources and Conservation
Peters, Jorg	Professor	Computer and Information Science and Engineering
Peterson, Anna	Professor	Religion
Peterson, Guy	Associate Professor	Architecture
Petigny, Alan	Associate Professor	History
Petitt, Frederick	Courtesy Assistant Professor	Entomology and Nematology
Petitto, John	Professor	Neuroscience
Petkova, Aneta	Assistant Professor	Physics
Petrasch, Joerg	Assistant Professor	Mechanical and Aerospace Engineering
Petty, Denise	Clinical Assistant Professor	Fisheries and Aquatic Sciences
Pham, Andrea	Associate Professor	Language, Literature and Culture
Pharies, David	Professor	Romance Languages and Literatures
Phelps, Steven	Associate Professor	Biology
Phillips, Winfred	Professor	Mechanical and Aerospace Engineering
Phillpot, Simon	Professor	Materials Science and Engineering
Phlips, Edward	Professor	Fisheries and Aquatic Sciences
Pigg, R. Morgan	Professor	Health Education and Behavior
Pilyugin, Sergei	Professor	Mathematics
Pine, William	Assistant Professor	Fisheries and Aquatic Sciences
Pinkney, Michael	Associate Professor	Theatre and Dance
Piramuthu, Selwyn	Professor	Information Systems and Operations Management
Ploetz, Randy	Professor	Plant Pathology
Plotto, Anne	Professor	Horticultural Science
Plummer, Caryn	Assistant Professor	Veterinary Medicine
Poceski, Mario	Associate Professor	Religion
Polfer, Nicolas	Assistant Professor	Chemistry
Polston, Jane	Professor	Plant Pathology

Pomeranz, Jamie	Research Assistant Professor	Behavioral Science and Community Health
Ponjuan, Luis	Assistant Professor	Human Development and Organizational Studies in Education
Pop Stojanovic, Zoran	Professor	Mathematics
Popenoe, Hugh	Professor	Soil and Water Science
Porter, Sanford	Assistant Professor	Entomology and Nematology
Porter, Wendell	Lecturer	Agricultural and Biological Engineering
Portier, Kenneth	Associate Professor	Statistics
Portillo, Margaret	Professor	Interior Design
Portuondo, Maria	Assistant Professor	History
Potsdam, Eric	Associate Professor	Linguistics
Powell, Charles	Professor	Plant Pathology
Powell, David	Scientist	Chemistry
Powell, Padgett	Professor	English
Powers, Kevin	Assistant Engineer	Materials Science and Engineering
Powers, Scott	Distinguished Professor	Applied Physiology and Kinesiology
Poynor, Robin	Professor	Art and Art History
Pozor, Malgorzata	Clinical Assistant Professor	Veterinary Medicine
Pozzi, Antonio	Assistant Professor	Veterinary Medicine
Pracht, Dale	Assistant Professor	Family, Youth and Community Sciences
Prairie, Yves	Professor	Fisheries and Aquatic Sciences
Pratt, Paul	Courtesy Assistant Professor	Entomology and Nematology
Presnell, Brett	Associate Professor	Statistics
Preston, James	Professor	Microbiology and Cell Science
Prevatt, David	Assistant Professor	Civil and Coastal Engineering
Price, Catherine	Assistant Professor	Clinical and Health Psychology
Price, James	Associate Professor	Entomology and Nematology
Primosch, Robert	Professor	Dentistry
Principe, Jose	Distinguished Professor	Electrical and Computer Engineering

Pring, Daryl	Professor	Plant Pathology
Pringle, Rose	Associate Professor	Teaching and Learning
Progulske-Fox, Ann	Distinguished Professor	Oral Biology
Properzio, William	Associate Professor	Nuclear and Radiological Engineering
Prugh, Peter	Associate Professor	Architecture
Puckett, William	Assistant Professor	Soil and Water Science
Puig, Ana	Associate Scholar	Human Development and Organizational Studies in Education
Pullammanappallil, Pratap	Assistant Professor	Agricultural and Biological Engineering
Pulvermacher, Neta	Assistant Professor	Theatre and Dance
Puri, Atul	Research Assistant Scientist	Agronomy
Purich, Daniel	Professor	Biochemistry and Molecular Biology
Putz, Francis	Professor	Biology
Qiu, Yi	Assistant Professor	Anatomy and Cell Biology
Qiu, Zongan	Associate Professor	Physics
Quesenberry, Kenneth	Professor	Agronomy
Quinn, David	Clinical Assistant Professor	Human Development and Organizational Studies in Education
Racevskis, Laila	Assistant Professor	Food and Resource Economics
Radunovich, Heidi	Assistant Professor	Family, Youth and Community Sciences
Rae, Darrell	Associate Professor	Veterinary Medicine
Raid, Richard	Professor	Plant Pathology
Raizada, Mohan	Distinguished Professor	Physiology and Functional Genomics
Rakov, Vladimir	Professor	Electrical and Computer Engineering
Ramond, Pierre	Distinguished Professor	Physics
Ramphal, Reuben	Professor	Molecular Genetics and Microbiology
Rand, Kenneth	Professor	Pathology, Immunology and Laboratory Medicine
Randles, Ronald	Professor	Statistics

Rangarajan, Anand	Associate Professor	Computer and Information Science and Engineering
Ranka, Sanjay	Professor	Computer and Information Science and Engineering
Rao, Anil	Assistant Professor	Mechanical and Aerospace Engineering
Rao, Murali	Professor	Mathematics
Rarey, Kyle	Professor	Anatomy and Cell Biology
Ray, Greg	Associate Professor	Philosophy
Ray, Heather	Assistant Professor	Physics
Ray, Robert	Professor	English
Razdan, Rahul	Professor	Electrical and Computer Engineering
Rea, Jennifer	Associate Professor	Classics
Rechcigl, John	Professor	Soil and Water Science
Reddy, Konda	Graduate Research Professor	Soil and Water Science
Reed, Jill	Associate Scientist	Anatomy and Cell Biology
Reed, S. Alexander	Assistant Professor	Music
Reep, Roger	Professor	Veterinary Medicine
Reeves, Westley	Eminent Scholar	Pathology, Immunology and Laboratory Medicine
Reid, Mark	Professor	English
Reier, Paul	Eminent Scholar	Neuroscience
Reilly, Jamie	Assistant Professor	Speech, Language and Hearing Sciences
Reinhard, Mary	Clinical Associate Professor	Veterinary Medicine
Reinhardt Adams, Carrie	Assistant Professor	Environmental Horticulture
Reisinger, Kimberly	Assistant Professor	Mechanical and Aerospace Engineering
Reisman, David	Associate Professor	Anatomy and Cell Biology
Reitze, David	Professor	Physics
Remshardt, Ralf	Associate Professor	Theatre and Dance
Ren, Fan	Distinguished Professor	Chemical Engineering
Renne, Rolf	Professor	Molecular Genetics and Microbiology
Repetto, Jeanne	Associate Professor	Special Education, School Psychology and Early Childhood

		Studies
Resnick, James	Associate Professor	Molecular Genetics and Microbiology
Rey, Jorge	Professor	Entomology and Nematology
Reyes, Francisco	Associate Scientist	Astronomy
Reyes, Leticia	Research Assistant Professor	Veterinary Medicine
Reyes De Corcuera, Jose	Assistant Professor	Food Science and Human Nutrition
Reynolds, Brent	Associate Professor	Neuroscience
Reynolds, John	Professor	Chemistry
Rhue, Roy	Professor	Soil and Water Science
Rice, Kelly	Assistant Professor	Microbiology and Cell Science
Rice, Kenneth	Associate Professor	Wildlife Ecology and Conservation
Rice, Kenneth	Professor	Psychology
Rich, Jimmy	Professor	Entomology and Nematology
Richard, Jean-Philippe	Associate Professor	Industrial and Systems Engineering
Richards, Lorie	Associate Professor	Occupational Therapy
Richards, Nigel	Professor	Chemistry
Richards, Paul	Professor	Music
Richardson, David	Professor	Chemistry
Ried, Lyle	Professor	Pharmaceutical Outcomes and Policy
Rieger, Mark	Professor	Horticultural Science
Rienzo, Barbara	Professor	Health Education and Behavior
Ries, Robert	Associate Professor	Building Construction
Riley, Joseph	Associate Professor	Dentistry
Rinzler, Andrew	Professor	Physics
Risco, Carlos	Professor	Veterinary Medicine
Risselada, Marije	Clinical Assistant Professor	Veterinary Medicine
Ritchie, Joe	Visiting Professor	Agricultural and Biological Engineering
Ritter, Gerhard	Professor Emeritus	Computer and Information Science and Engineering
Ritter, Jay	Eminent Scholar	Finance, Insurance and Real Estate
Ritz, Louis	Associate Professor	Neuroscience
Ritzhaupt, Albert	Assistant Professor	Teaching and Learning

Riva, Alberto	Assistant Professor	Molecular Genetics and Microbiology
Roberge, Celeste	Professor	Art and Art History
Roberts, Beverly	Professor	Nursing
Roberts, Churchill	Professor	Journalism and Communications
Roberts, Pamela	Professor	Plant Pathology
Roberts, Stephen	Professor	Veterinary Medicine
Roberts, Thomas	Associate Professor	Agricultural Education and Communication
Robertson, Kevin	Assistant Professor	Wildlife Ecology and Conservation
Robertson, Sheilah	Professor	Veterinary Medicine
Robinson, Michael	Professor	Clinical and Health Psychology
Robinson, Paul	Professor	Mathematics
Robinson, Paul	Assistant Professor	Architecture
Robinson, Russell	Professor	Music
Robison, Mary	Professor	English
Rockwood, Donald	Professor	Forest Resources and Conservation
Rodrick, Gary	Professor	Food Science and Human Nutrition
Rodrigue, James	Professor	Clinical and Health Psychology
Rodrigues, Helena	Assistant Professor	Political Science
Rodriguez, Carmen	Assistant Professor	Nursing
Rogal, Maria	Associate Professor	Art and Art History
Rogers, Michael	Associate Professor	Entomology and Nematology
Roitberg, Adrian	Associate Professor	Chemistry
Roka, Fritz	Associate Professor	Food and Resource Economics
Roland, Dennis	Associate Professor	Art and Art History
Rollins, Jeffrey	Associate Professor	Plant Molecular and Cellular Biology
Romano, Richard	Professor	Economics
Romeijn, Hilbrand	Professor	Industrial and Systems Engineering
Romeo, Tony	Professor	Microbiology and Cell Science
Ron, Ruth	Assistant Professor	Architecture
Roper, Steven	Professor	Neuroscience
Roque, Reynaldo	Professor	Civil and Coastal Engineering
Rosalsky, Andrew	Professor	Statistics
Rose, Richard	Associate Professor	Theatre and Dance

Rosenbaum, Walter	Professor	Political Science
Rosenbek, John	Professor	Speech, Language and Hearing Sciences
Rosenberg, Leah	Associate Professor	English
Rosenson, Beth	Associate Professor	Political Science
Ross, Dorene	Professor	Teaching and Learning
Ross, Elizabeth	Assistant Professor	Art and Art History
Ross, James	Associate Scientist	Wildlife Ecology and Conservation
Rosser, Charles	Assistant Professor	Pharmacology and Therapeutics
Rouseff, Russell	Professor	Food Science and Human Nutrition
Rovine, Victoria	Associate Professor	Art and Art History
Rowe, Meredeth	Professor	Nursing
Rowe, Thomas	Associate Professor	Pharmacology and Therapeutics
Rowland, Neil	Professor	Psychology
Roy, Subrata	Associate Professor	Mechanical and Aerospace Engineering
Rozensky, Ronald	Professor	Clinical and Health Psychology
Rudnytsky, Peter	Professor	English
Rudyak, Yuli	Professor	Mathematics
Rush, Mark	Professor	Economics
Rush, Sharon	Professor	Comparative Law
Ruskin, James	Professor	Dentistry
Russell, Wayne	Clinical Associate Professor	Pharmaceutical Outcomes and Policy
Russell-Brown, Katheryn	Professor	Comparative Law
Russo, Raymond	Associate Professor	Geological Sciences
Russo, Sandra	Associate Scholar	Women's Studies
Ruth, Byron	Professor	Civil and Coastal Engineering
Rylkova, Galina	Associate Professor	Language, Literature and Culture
Ryndak, Diane	Associate Professor	Special Education, School Psychology and Early Childhood Studies
Ryngaert, Michael	Professor	Finance, Insurance and Real Estate
Saab, Tarek	Assistant Professor	Physics
Sabin, John	Professor	Physics

Sadler, Troy	Associate Professor	Teaching and Learning
Safa, Helen	Professor	Anthropology
Sagas, Michael	Professor	Tourism, Recreation, and Sport Management
Sahni, Sartaj	Distinguished Professor	Computer and Information Science and Engineering
Sain, James	Professor	Music
Salemi, Marco	Assistant Professor	Pathology, Immunology and Laboratory Medicine
Salyani, Masoud	Professor	Agricultural and Biological Engineering
Samant, Sanjiv	Associate Professor	Nuclear and Radiological Engineering
Sammons, David	Professor	Agronomy
Samuelson, Don	Professor	Veterinary Medicine
Sanchez, Linda	Associate Professor	Veterinary Medicine
Sanchez, Raul	Associate Professor	English
Sanders, Beverly	Associate Professor	Computer and Information Science and Engineering
Sanford, Ann	Associate Professor	Religion
Sanford, Malcolm	Professor Emeritus	Entomology and Nematology
Sankar, Bhavani	Professor	Mechanical and Aerospace Engineering
Sansalone, John	Professor	Environmental Engineering Sciences
Santos, Bielinski	Assistant Professor	Horticultural Science
Santos, Jose	Associate Professor	Animal Sciences
Sapienza, Christine	Professor	Speech, Language and Hearing Sciences
Sappington, David	Eminent Scholar	Economics
Sarajedini, Ata	Professor	Astronomy
Sarajedini, Vicki	Associate Professor	Astronomy
Sarkisian, Matthew	Assistant Professor	Neuroscience
Sarntinoranont, Malisa	Associate Professor	Mechanical and Aerospace Engineering
Sartain, Jerry	Professor	Soil and Water Science
Sassaman, Kenneth	Associate Professor	Anthropology
Satoh, Minoru	Research Associate Professor	Pathology, Immunology and Laboratory Medicine

Sawyer, Horace	Professor	Behavioral Science and Community Health
Sawyer, Wallace	Professor	Mechanical and Aerospace Engineering
Sayeski, Peter	Associate Professor	Physiology and Functional Genomics
Scarpa, John	Professor	Fisheries and Aquatic Sciences
Scarpace, Nihal	Professor	Pharmacology and Therapeutics
Scarpace, Philip	Professor	Pharmacology and Therapeutics
Schaefer, Joseph	Professor	Wildlife Ecology and Conservation
Schaffer, Susan	Clinical Associate Professor	Nursing
Schanze, Kirk	Professor	Chemistry
Scharf, Michael	Associate Professor	Entomology and Nematology
Schatz, Desmond	Professor	Pathology, Immunology and Laboratory Medicine
Schaub, Diane	Senior Lecturer	Industrial and Systems Engineering
Schauble, Paul	Professor	Psychology
Scheffrahn, Rudolf	Professor	Entomology and Nematology
Scher, Richard	Professor	Political Science
Scheuer, Deborah	Associate Professor	Physiology and Functional Genomics
Schmeling, Gareth	Professor Emeritus	Classics
Schmertmann, John	Professor	Civil and Coastal Engineering
Schmidt, Peter	Professor	Anthropology
Schmidt, Ronald	Professor	Food Science and Human Nutrition
Schmink, Marianne	Professor	Anthropology
Schmitz, Andrew	Eminent Scholar	Food and Resource Economics
Schmitz, Tony	Associate Professor	Mechanical and Aerospace Engineering
Schnadelbach, Raymond	Professor	Landscape Architecture
Schneider, Keith	Associate Professor	Food Science and Human Nutrition
Schneider, Markus	Associate Professor	Computer and Information Science and Engineering
Schneider, Richard	Professor	Urban and Regional Planning
Schorb, Jodi	Assistant Professor	English
Schubring, Duwayne	Assistant Professor	Nuclear and Radiological Engineering
Schueller, John	Professor	Mechanical and Aerospace Engineering

Schueller, Malini	Professor	English
Schuerger, Andrew	Research Assistant Professor	Plant Pathology
Schultz, Gregory	Professor	Biochemistry and Molecular Biology
Schumann, Arnold	Associate Professor	Soil and Water Science
Schuster, David	Professor	Entomology and Nematology
Schuur, Edward	Associate Professor	Biology
Schwartz, Katrina	Assistant Professor	Political Science
Scicchitano, Michael	Associate Professor	Political Science
Scornik, Juan	Professor	Pathology, Immunology and Laboratory Medicine
Scott, Edward	Professor	Molecular Genetics and Microbiology
Scott, Karen	Senior Biological Scientist	Veterinary Medicine
Scott, Michael	Associate Professor	Chemistry
Screaton, Elizabeth	Associate Professor	Geological Sciences
Seal, Dakshina	Assistant Scientist	Entomology and Nematology
Seale, James	Professor	Food and Resource Economics
Seawright, Jack	Associate Professor	Entomology and Nematology
Segal, Corin	Professor	Mechanical and Aerospace Engineering
Segal, Mark	Associate Professor	Anatomy and Cell Biology
Segal, Richard	Professor	Pharmaceutical Outcomes and Policy
Seifert, Hans Juergen	Associate Professor	Materials Science and Engineering
Sellers, Brent	Assistant Professor	Agronomy
Semple-Rowland, Susan	Professor	Neuroscience
Sensbach, Jon	Professor	History
Settles, Andrew	Associate Professor	Horticultural Science
Seubert, Christoph	Associate Professor	Pharmaceutics
Seymour, Sandra	Associate Professor	Nursing
Shabanov, Sergei	Associate	Mathematics

	Professor	
Shah, Dinesh	Professor	Chemical Engineering
Shanker, Ajay	Associate Professor	Building Construction
Shanmugam, Keelnatham	Professor	Microbiology and Cell Science
Shapiro, Jeffrey	Professor	Entomology and Nematology
Sharp, Daniel	Professor	Animal Sciences
Sharpe, Kevin	Associate Professor	Music
Shatters, Robert	Assistant Professor	Agronomy
Shaw, Gerard	Professor	Neuroscience
She, Jin-Xiong	Professor	Pathology, Immunology and Laboratory Medicine
Shea, John	Associate Professor	Electrical and Computer Engineering
Shearer, Jan	Professor	Veterinary Medicine
Shechtman, Orit	Associate Professor	Occupational Therapy
Shehan, Constance	Professor	Sociology
Shelnutt, Karla	Assistant Professor	Family, Youth and Community Sciences
Shen, Chiayi	Associate Professor	Materials Science and Engineering
Shen, Li-Chien	Professor	Mathematics
Shen, Wei	Associate Professor	Management
Sheng, Y.	Professor	Civil and Coastal Engineering
Shenkman, Elizabeth	Professor	Epidemiology and Health Policy Research
Shepard, Herschel	Professor	Architecture
Sheplak, Mark	Professor	Mechanical and Aerospace Engineering
Sheppard, Barbara	Clinical Associate Professor	Veterinary Medicine
Sheppard, Donald	Professor	Civil and Coastal Engineering
Shepperd, James	Professor	Psychology
Sheremet, Alexandru	Associate Professor	Civil and Coastal Engineering
Sherif, Sherif	Professor	Mechanical and Aerospace Engineering
Sherrard, Peter	Associate Professor	Human Development and Organizational Studies in Education
Shih, Andre	Assistant Professor	Veterinary Medicine
Shih, Chuan-Kang	Associate Professor	Anthropology
Shirk, Paul	Courtesy	Entomology and Nematology

	Assistant Professor	
Shiverick, Kathleen	Professor	Pharmacology and Therapeutics
Shoaf, Richard	Professor	English
Shober, Amy	Assistant Professor	Soil and Water Science
Shoemaker, David	Assistant Professor	Entomology and Nematology
Shorr, Ronald	Professor	Epidemiology (MD/PH Doctorate)
Shrivastav, Mini	Research Assistant Professor	Speech, Language and Hearing Sciences
Shrivastav, Rahul	Associate Professor	Speech, Language and Hearing Sciences
Shugan, Steven	Eminent Scholar	Marketing
Shukla, Sanjay	Associate Professor	Agricultural and Biological Engineering
Shukla, Shailendra	Research Assistant Professor	Nuclear and Radiological Engineering
Siebein, Gary	Professor	Architecture
Siemann, Dietmar	Professor	Pharmacology and Therapeutics
Sieving, Kathryn	Professor	Wildlife Ecology and Conservation
Sigmund, Wolfgang	Professor	Materials Science and Engineering
Sigua, Gilbert	Assistant Professor	Soil and Water Science
Sikivie, Pierre	Professor	Physics
Silhacek, Donald	Courtesy Associate Professor	Entomology and Nematology
Silliman, Brian	Assistant Professor	Biology
Silveira, Maria	Assistant Professor	Soil and Water Science
Silver, Christopher	Professor	Design, Construction, and Planning
Silverman, David	Distinguished Professor	Pharmacology and Therapeutics
Silverstein, Janet	Professor	Clinical and Health Psychology
Simmons, Gwendolyn	Assistant Professor	Religion
Simone, Gary	Professor	Plant Pathology
Simonne, Amarat	Associate Professor	Food Science and Human Nutrition
Simpson, James	Associate Professor	Industrial and Systems Engineering
Sims, Charles	Professor	Food Science and Human

		Nutrition
Sin, Peter	Professor	Mathematics
Sinclair, Thomas	Professor	Agronomy
Sindelar, Paul	Professor	Special Education, School Psychology and Early Childhood Studies
Singh, Rajiv	Professor	Materials Science and Engineering
Sinnott, Susan	Professor	Materials Science and Engineering
Sitharam, Meera	Associate Professor	Computer and Information Science and Engineering
Sitren, Harry	Professor	Food Science and Human Nutrition
Sivinski, John	Courtesy Assistant Professor	Entomology and Nematology
Sjoberg, Laura	Assistant Professor	Political Science
Sjoden, Glenn	Associate Professor	Nuclear and Radiological Engineering
Skelley, Paul	Courtesy Assistant Professor	Entomology and Nematology
Skelley, Robert	Professor	Art and Art History
Slawson, Brian	Associate Professor	Art and Art History
Slayton, William	Assistant Professor	Molecular Genetics and Microbiology
Sleasman, John	Professor	Pathology, Immunology and Laboratory Medicine
Slinn, Donald	Associate Professor	Civil and Coastal Engineering
Sloan, Kenneth	Professor	Medicinal Chemistry
Slutsky, Steven	Professor	Economics
Small, Parker	Professor	Pathology, Immunology and Laboratory Medicine
Smart, Grover	Professor Emeritus	Entomology and Nematology
Smartt, Chelsea	Associate Professor	Entomology and Nematology
Smith, Benjamin	Associate Professor	Political Science
Smith, Benjamin	Scientist	Chemistry
Smith, Brenda Jo	Associate Professor	Music
Smith, Daniel	Professor	Political Science
Smith, David	Professor	Biology
Smith, David	Professor	Psychology
Smith, Douglas	Professor	Geological Sciences
Smith, Haywood	Associate	Astronomy

	Professor	
Smith, Jason	Assistant Professor	Forest Resources and Conservation
Smith, Jonathan	Professor	Industrial and Systems Engineering
Smith, Lora	Assistant Professor	Wildlife Ecology and Conservation
Smith, Nan	Professor	Art and Art History
Smith, Nigel	Professor	Geography
Smith, Rex	Professor	Agronomy
Smith, Rick	Associate Professor	Mathematics
Smith, Scot	Professor	Forest Resources and Conservation
Smith, Sondra	Associate Professor	Human Development and Organizational Studies in Education
Smith, Stanley	Professor	Economics
Smith, Stephanie	Professor	English
Smith, Stephen	Professor	Special Education, School Psychology and Early Childhood Studies
Smith, Suzanna	Associate Professor	Family, Youth and Community Sciences
Smith, Travis	Assistant Professor	Religion
Smith, Wayne	Professor Emeritus	Forest Resources and Conservation
Smith, Wesley	Associate Professor	Neuroscience
Smith-Bonahue, Tina	Associate Professor	Special Education, School Psychology and Early Childhood Studies
Smittle, Burrell	Courtesy Professor	Entomology and Nematology
Smocovitis, Vassiliki	Professor	Biology
Snider, Martha	Associate Professor	Nursing
Snodgrass, Chris	Professor	English
Snyder, George	Professor	Soil and Water Science
Snyder, Patricia	Professor	Special Education, School Psychology and Early Childhood Studies
Snyder, Patti	Associate Professor	Veterinary Medicine
Snyder, Richard	Associate Professor	Molecular Genetics and Microbiology
So, Franky	Professor	Materials Science and Engineering
Sobel, Eric	Associate	Pathology, Immunology and

	Professor	Laboratory Medicine
Soderholm, Karl	Professor	Materials Science and Engineering
Sollenberger, Lynn	Professor	Agronomy
Soloviev, Andrey	Research Assistant Professor	Electrical and Computer Engineering
Soltis, Douglas	Distinguished Professor	Biology
Soltis, Pamela	Distinguished Professor	Botany
Song, Sihong	Associate Professor	Pharmaceutics
Song, Wen-Yuan	Associate Professor	Plant Pathology
Sorbille, Martin	Assistant Professor	Spanish and Portuguese Studies
Sorek, Tamir	Assistant Professor	Sociology
Sorg, Brian	Assistant Professor	Biomedical Engineering
Sourakov, Andrei	Assistant Scientist	Entomology and Nematology
Southwick, Frederick	Professor	Molecular Genetics and Microbiology
Southworth, Jane	Associate Professor	Geography
Sow, Alioune	Assistant Professor	Language, Literature and Culture
Spann, Timothy	Assistant Professor	Horticultural Science
Spengler, John	Associate Professor	Tourism, Recreation, and Sport Management
Spiker, Ted	Associate Professor	Journalism and Communications
Spillane, Joseph	Professor	History
Spranger, Michael	Professor	Family, Youth and Community Sciences
Spreen, Thomas	Professor	Food and Resource Economics
Sprenkel, Richard	Professor	Entomology and Nematology
Spring, Anita	Professor	Anthropology
Srinivasan, Sivaramakrishnan	Assistant Professor	Civil and Coastal Engineering
Srivastava, Ramakant	Professor	Electrical and Computer Engineering
St. Mary, Colette	Associate Professor	Biology
Stacciarini, Jeanne-Marie	Assistant Professor	Nursing
Stacpoole, Peter	Professor	Biochemistry and Molecular Biology

Stamper, Michael	Assistant Professor	Fisheries and Aquatic Sciences
Stanfield-Mazzi, Maya	Assistant Professor	Art and Art History
Stange, Lionel	Courtesy Associate Professor	Entomology and Nematology
Stanley, Craig	Professor	Soil and Water Science
Stansly, Phil	Professor	Entomology and Nematology
Stanton, Christopher	Professor	Physics
Staples, Charles	Professor	Animal Sciences
Staras, Stephanie	Research Assistant Professor	Epidemiology and Health Policy Research
Staudhammer, Christina	Assistant Professor	Forest Resources and Conservation
Stavropoulos, Mary	Associate Professor	Dentistry
Stechmiller, Joyce	Associate Professor	Nursing
Steck, Gary	Courtesy Assistant Professor	Entomology and Nematology
Stedman, Nicole	Associate Professor	Agricultural Education and Communication
Stehouwer, Donald	Professor	Psychology
Stein, Taylor	Associate Professor	Forest Resources and Conservation
Steindler, Dennis	Professor	Neuroscience
Steiner, Ruth	Associate Professor	Urban and Regional Planning
Stelinski, Lukasz	Assistant Professor	Entomology and Nematology
Stenner, Jack	Assistant Professor	Art and Art History
Stepp, John	Associate Professor	Anthropology
Sterk, Andrea	Associate Professor	History
Sterns, James	Associate Professor	Food and Resource Economics
Stevens, Bruce	Professor	Physiology and Functional Genomics
Stewart, Carol	Professor	Dentistry
Stewart, Gregory	Professor	Physics
Stewart, Jon	Professor	Chemistry
Stitt, Greg	Assistant Professor	Electrical and Computer Engineering
Stoilkova, Maria	Assistant Professor	Anthropology

Stoner, Kristen	Associate Professor	Music
Storch, Jason	Affiliate Professor	Tourism, Recreation, and Sport Management
Strandberg, James	Professor	Plant Pathology
Strauss, Cyd	Clinical Associate Professor	Clinical and Health Psychology
Streit, Wolfgang	Professor	Neuroscience
Strosberg, Arthur	Professor	Molecular Genetics and Microbiology
Su, Nan-Yao	Professor	Entomology and Nematology
Subhash, Ghatu	Professor	Mechanical and Aerospace Engineering
Suchman, David	Professor	Psychology
Sugrue, Stephen	Professor	Anatomy and Cell Biology
Sullivan, James	Assistant Professor	Building Construction
Sullivan, Neil	Professor	Physics
Summers, Stephen	Professor	Mathematics
Sumners, Colin	Professor	Physiology and Functional Genomics
Sun, Yijun	Assistant Scientist	Electrical and Computer Engineering
Sunquist, Melvin	Professor	Wildlife Ecology and Conservation
Sussman, Lewis	Professor	Classics
Sutherland, John	Professor	Journalism and Communications
Sutton, Laura	Clinical Assistant Professor	Nursing
Svoronos, Spyros	Professor	Chemical Engineering
Swaminathan, Sankar	Professor	Molecular Genetics and Microbiology
Swanson, Bert	Professor	Political Science
Swanson, Maurice	Professor	Molecular Genetics and Microbiology
Swett, Robert	Associate Professor	Fisheries and Aquatic Sciences
Swisher, Marilyn	Associate Professor	Family, Youth and Community Sciences
Szabo, Nancy	Research Assistant Professor	Veterinary Medicine
Tabachnick, Walter	Professor	Entomology and Nematology
Takano, Yasumasa	Professor	Physics
Talathi, Sachin	Assistant Professor	Biomedical Engineering
Talham, Daniel	Professor	Chemistry
Tan, Jonathan	Associate	Astronomy

	Professor	
Tan, Weihong	Professor	Chemistry
Tanner, David	Distinguished Professor	Physics
Tanner, George	Professor	Wildlife Ecology and Conservation
Tapley, T.	Master Lecturer	Finance, Insurance and Real Estate
Tatem, Andrew	Assistant Professor	Geography
Taylor, Bron	Professor	Religion
Taylor, Curtis	Assistant Professor	Mechanical and Aerospace Engineering
Taylor, Fred	Professor	Computer and Information Science and Engineering
Taylor, Timothy	Professor	Food and Resource Economics
Teal, Peter	Courtesy Professor	Entomology and Nematology
Tebbett, Ian	Research Professor	Medicinal Chemistry
Tedesco, Joseph	Professor	Civil and Coastal Engineering
Teixeira, Arthur	Professor	Agricultural and Biological Engineering
Telesco, Charles	Professor	Astronomy
Telg, Ricky	Professor	Agricultural Education and Communication
Tenbroeck, Saundra	Associate Professor	Animal Sciences
Teplitski, Max	Associate Professor	Soil and Water Science
Terada, Naohiro	Professor	Pathology, Immunology and Laboratory Medicine
Terzian, Sevan	Associate Professor	Teaching and Learning
Thai, My	Assistant Professor	Computer and Information Science and Engineering
Thapa, Brijesh	Associate Professor	Tourism, Recreation, and Sport Management
Thebaut, Stephen	Assistant Professor	Computer and Information Science and Engineering
Therriault, David	Assistant Professor	Human Development and Organizational Studies in Education
Thetford, Mack	Associate Professor	Environmental Horticulture
Thieke, Robert	Assistant Professor	Civil and Coastal Engineering
Thiele, Leslie	Professor	Political Science
Thomas, Jennifer	Associate Professor	Music
Thomas, John	Research	Soil and Water Science

	Assistant Professor	
Thomas, Loris	Clinical Assistant Professor	Nursing
Thomas, Michael	Courtesy Assistant Professor	Entomology and Nematology
Thomas, Robert	Associate Professor	Management
Thomas, Steven	Assistant Professor	Music
Thomas-Houston, Marilyn	Associate Professor	Anthropology
Thompson, Floyd	Associate Professor	Neuroscience
Thompson, Kevin	Assistant Professor	Landscape Architecture
Thompson, Patrick	Lecturer	Information Systems and Operations Management
Thompson, Paul	Professor	Civil and Coastal Engineering
Thompson, Scott	Professor	Electrical and Computer Engineering
Thomson, Robert	Associate Professor	English
Thorbjarnarson, John	Professor	Wildlife Ecology and Conservation
Thorn, Charles	Professor	Physics
Thrall, Grant	Professor	Geography
Thrift, Todd	Associate Professor	Animal Sciences
Thurner, Mark	Associate Professor	History
Tia, Mang	Professor	Civil and Coastal Engineering
Tillander, Michelle	Assistant Professor	Art and Art History
Tillman, Barry	Associate Professor	Agronomy
Tillman, Mark	Associate Professor	Applied Physiology and Kinesiology
Tilson, William	Professor	Architecture
Tisher, C. Craig	Professor	Anatomy and Cell Biology
Tobler, Amy	Research Assistant Professor	Epidemiology and Health Policy Research
Toor, Gurpal	Assistant Professor	Soil and Water Science
Torres, Nayda	Professor	Family, Youth and Community Sciences
Torres Antonini, Maruja	Associate Professor	Interior Design

Torres-Rivera, Edil	Professor	Human Development and Organizational Studies in Education
Tosi, Henry	Professor Emeritus	Management
Townsend, Jane	Associate Professor	Teaching and Learning
Townsend, Timothy	Professor	Environmental Engineering Sciences
Tran-Son-Tay, Roger	Professor	Mechanical and Aerospace Engineering
Traversa, Enrico	Courtesy Professor	Materials Science and Engineering
Travis, Patricia	Associate Professor	Women's Studies
Treadwell, Danielle	Assistant Professor	Horticultural Science
Treise, Deborah	Professor	Journalism and Communications
Treloar, Donna	Associate Professor	Nursing
Tremura, Welson	Associate Professor	Music
Trickey, Samuel	Professor	Physics
Triplett, Eric	Professor	Microbiology and Cell Science
Tripp, Bernell	Associate Professor	Journalism and Communications
Troedsson, Mats	Professor	Veterinary Medicine
Trumble, Troy	Assistant Professor	Veterinary Medicine
Tseng, Yiider	Associate Professor	Chemical Engineering
Tu, Chingkuang	Associate Scientist	Pharmacology and Therapeutics
Tucker, Carolyn	Professor	Psychology
Tucker, Jenny	Associate Professor	Accounting
Tufekci, Suleyman	Associate Professor	Industrial and Systems Engineering
Tulenko, James	Professor	Nuclear and Radiological Engineering
Tumlinson, James	Courtesy Professor	Entomology and Nematology
Turim, Maureen	Professor	English
Turner, Allen	Lecturer	Agricultural and Biological Engineering
Turner, Benjamin	Assistant Professor	Soil and Water Science
Turner, Glenn	Associate Professor	Dentistry
Turner, Josephine	Professor	Family, Youth and Community

		Sciences
Turner, R.	Professor	Food Science and Human Nutrition
Turull, Alexandre	Professor	Mathematics
Ukeiley, Lawrence	Assistant Professor	Mechanical and Aerospace Engineering
Ulanowicz, Anastasia	Assistant Professor	English
Ulmer, Gregory	Professor	English
Uman, Martin	Distinguished Professor	Electrical and Computer Engineering
Undeen, Albert	Courtesy Associate Professor	Entomology and Nematology
Ungor, Alper	Associate Professor	Computer and Information Science and Engineering
Uphold, Constance	Professor	Health Services Research, Management, and Policy
Ural, Ant	Associate Professor	Electrical and Computer Engineering
Uryasev, Stanislav	Professor	Industrial and Systems Engineering
Useche, Maria Del	Assistant Professor	Food and Resource Economics
Vakharia, Asoo	Professor	Information Systems and Operations Management
Vala, Martin	Professor	Chemistry
Valenstein, Edward	Professor	Clinical and Health Psychology
Vallad, Gary	Assistant Professor	Plant Pathology
Vallandingham, Christopher	Associate University Librarian	Comparative Law
Valle-Levinson, Arnoldo	Professor	Civil and Coastal Engineering
van Bruggen, Ariena	Professor	Plant Pathology
Van Deusen, Julia	Professor	Occupational Therapy
Van Hook, John	Associate University Librarian	English
Van Oostrom, Johannes	Associate Professor	Biomedical Engineering
Van Steen, Gonda	Associate Professor	Classics
Vandenborne, Krista	Professor	Physical Therapy
Vander Meer, Robert	Courtesy Assistant Professor	Entomology and Nematology
Vandiver, Frances	Professor	Human Development and

		Organizational Studies in Education
Vansickle, John	Professor	Food and Resource Economics
Varnes, Jill	Professor	Health Education and Behavior
Vasenkov, Sergey	Assistant Professor	Chemical Engineering
Vasquez, Manuel	Associate Professor	Religion
Vega, Sergio	Associate Professor	Art and Art History
Veige, Adam	Assistant Professor	Chemistry
Velozo, Craig	Professor	Occupational Therapy
Vemuri, Baba	Professor	Computer and Information Science and Engineering
Vendramini, Joao	Assistant Professor	Agronomy
Vera, Hernan	Professor	Sociology
Vergot, Peter	Professor	Agricultural Education and Communication
Vermerris, Willem	Associate Professor	Agronomy
Vernetson, William	Associate Engineer	Nuclear and Radiological Engineering
Vickroy, Thomas	Professor	Veterinary Medicine
Villalon, Leonardo	Associate Professor	Political Science
Vince, Andrew	Professor	Mathematics
Vinson, Betty	Clinical Associate Professor	Speech, Language and Hearing Sciences
Vogel, Walter	Associate Professor	Epidemiology and Health Policy Research
Vollmer, Timothy	Professor	Psychology
Vose, Frederic	Assistant Professor	Fisheries and Aquatic Sciences
Vu, Joseph	Professor	Agronomy
Vu-Quoc, Loc	Professor	Mechanical and Aerospace Engineering
Wachsman, Eric	Professor	Materials Science and Engineering
Wade, Sidney	Professor	English
Wagenaar, Alexander	Professor	Epidemiology and Health Policy Research
Wagener, Kenneth	Professor	Chemistry
Wagman, Robert	Associate Professor	Classics
Wagner, Elaine	Professor	Journalism and Communications
Wald, Kenneth	Distinguished Professor	Political Science

Waldo, Douglas	Associate Professor	Economics
Waldron, Nancy	Associate Professor	Special Education, School Psychology and Early Childhood Studies
Walker, Clay	Professor	Oral Biology
Walker, Karen	Assistant Scientist	Anthropology
Walker, Matthew	Assistant Professor	Tourism, Recreation, and Sport Management
Wallace, Margaret	Professor	Biochemistry and Molecular Biology
Wallet, Shannon	Assistant Professor	Dentistry
Walsh, Allyson	Associate Professor	Wildlife Ecology and Conservation
Walsh, Michael	Clinical Associate Professor	Veterinary Medicine
Walsh, Thomas	Associate Professor	Mathematics
Walsh-Childers, Kim	Professor	Journalism and Communications
Walter, Glenn	Associate Professor	Physiology and Functional Genomics
Walters, Bradley	Assistant Professor	Architecture
Walters, Carl	Professor	Fisheries and Aquatic Sciences
Wang, Nian	Assistant Professor	Microbiology and Cell Science
Wang, Qingren	Assistant Scientist	Soil and Water Science
Ward, Ronald	Professor	Food and Resource Economics
Warren, Lori	Associate Professor	Animal Sciences
Warren, Michael	Associate Professor	Anthropology
Washburn, Scott	Associate Professor	Civil and Coastal Engineering
Washington, Elizabeth	Professor	Teaching and Learning
Watt, Mary	Associate Professor	Language, Literature and Culture
Waxenberg, Lori	Clinical Associate Professor	Clinical and Health Psychology
Waybright, David	Professor	Music
Wayland, Ratree	Associate Professor	Linguistics
Waylen, Peter	Professor	Geography
Wayne, Marta	Associate	Biology

	Professor	
Weaver, Jason	Associate Professor	Chemical Engineering
Webb, Susan	Associate Professor	Entomology and Nematology
Weber, Bryan	Associate Professor	Nursing
Webster, Gregory	Assistant Professor	Psychology
Weems, Howard	Courtesy Associate Professor	Entomology and Nematology
Wegner, Phillip	Professor	English
Wehmeyer, Ann	Associate Professor	Language, Literature and Culture
Wei, Wei	Assistant Professor	Chemistry
Weigold, Michael	Professor	Journalism and Communications
Weiler, Robert	Professor	Health Education and Behavior
Weitz, Barton	Eminent Scholar	Marketing
Weldon, Richard	Professor	Food and Resource Economics
Welt, Bruce	Associate Professor	Agricultural and Biological Engineering
Weltman-Aron, Brigitte	Associate Professor	Language, Literature and Culture
Werch, Chudley	Professor	Health Education and Behavior
West, Carol	Professor	Economics
West, Robin	Professor	Psychology
West-Olatunji, Cirecie	Associate Professor	Human Development and Organizational Studies in Education
Westin, Robert	Professor	Art and Art History
Weston, Edward	Associate Professor	Journalism and Communications
Wheeler, Bruce	Professor	Biomedical Engineering
Wheeler, Gregory	Courtesy Associate Professor	Entomology and Nematology
Wheeler, Timothy	Eminent Scholar	Dentistry
Whitaker, Vance	Assistant Professor	Horticultural Science
White, Edward	Associate Professor	English
White, Keith	Associate Professor	Psychology
White, Luise	Professor	History
White, Timothy	Professor	Forest Resources and Conservation

White, Tony	Professor	Architecture
Whiting, Bernard	Professor	Physics
Whitney, Ellsworth	Professor	Materials Science and Engineering
Widmer, Charles	Associate Professor	Neuroscience
Wielbo, Donna	Research Associate Professor	Medicinal Chemistry
Wiens, Brenda	Research Assistant Professor	Clinical and Health Psychology
Wiens, Gloria	Associate Professor	Mechanical and Aerospace Engineering
Wilkinson, Edward	Professor	Pathology, Immunology and Laboratory Medicine
Williams, Charles	Professor	Tourism, Recreation, and Sport Management
Williams, David	Courtesy Assistant Professor	Entomology and Nematology
Williams, Judith W. B.	Professor	Theatre and Dance
Williams, Kathryn	Scholar	Chemistry
Williams, Mary	Associate Professor	Agronomy
Williams, Norris	Curator	Botany
Williams, Philip	Professor	Political Science
Williams, Sally	Associate Professor	Animal Sciences
Williams, Sara	Associate Professor	Landscape Architecture
Williams, William	Professor	Communication Sciences and Disorders
Willis, Steven	Professor	Taxation
Willmott, Keith	Associate Curator	Entomology and Nematology
Willumson, Glenn	Associate Professor	Art and Art History
Wilson, David	Professor	Mathematics
Wilson, Joseph	Assistant Professor	Computer and Information Science and Engineering
Wilson, Patrick	Associate Professor	Soil and Water Science
Wilson, Robert	Professor	Astronomy
Wilson, Sandra	Associate Professor	Environmental Horticulture
Wiltshire, Caroline	Associate Professor	Linguistics
Winefordner, James	Professor Emeritus	Chemistry

Wingate, Judith	Clinical Associate Professor	Speech, Language and Hearing Sciences
Wingo, Charles	Professor	Physiology and Pharmacology (IDP)
Winner, Lawrence	Senior Lecturer	Statistics
Winter, William	Professor	Immunology and Microbiology (IDP)
Winterstein, Almut	Associate Professor	Pharmaceutical Outcomes and Policy
Wise, Benjamin	Assistant Professor	History
Wise, William	Associate Professor	Environmental Engineering Sciences
Witmer, D	Associate Professor	Philosophy
Wohlgemuth, Stephanie	Assistant Professor	Animal Sciences
Wojcik, Daniel	Courtesy Assistant Professor	Entomology and Nematology
Wolf, Michael	Professor	Comparative Law
Wolpert, Andrew	Associate Professor	Classics
Wong, Fong	Assistant Professor	Dentistry
Wong, Tan	Professor	Electrical and Computer Engineering
Woo, Raymund	Clinical Associate Professor	Physical Therapy
Wood, Charles	Professor	Physiology and Functional Genomics
Wood, Charles	Professor	Sociology
Wood, R. Craig	Professor	Human Development and Organizational Studies in Education
Woodard, Richard	Professor	Physics
Woodruff, Robert	Courtesy Professor	Entomology and Nematology
Woods, Patricia	Associate Professor	Political Science
Worth, John	Assistant Professor	Anthropology
Wright, Alan	Assistant Professor	Soil and Water Science
Wright, Anita	Associate Professor	Food Science and Human Nutrition
Wright, Danaya	Professor	Comparative Law
Wright, David	Professor	Agronomy
Wright, John	Professor	Journalism and

		Communications
Wright, Robin	Associate Professor	Religion
Wright, Thomas	Professor	Rehabilitation Science
Wronski, Thomas	Professor	Veterinary Medicine
Wu, Chang-Yu	Professor	Environmental Engineering Sciences
Wu, Dapeng	Associate Professor	Electrical and Computer Engineering
Wu, Lizi	Assistant Professor	Molecular Genetics and Microbiology
Wynne, Clive	Professor	Psychology
Wysocki, Allen	Associate Professor	Food and Resource Economics
Xia, Changqing	Assistant Professor	Pathology, Immunology and Laboratory Medicine
Xia, Ye	Associate Professor	Computer and Information Science and Engineering
Xie, Huikai	Associate Professor	Electrical and Computer Engineering
Xie, Huisheng	Clinical Associate Professor	Veterinary Medicine
Xie, Jinhong	Professor	Marketing
Xue, Jiangeng	Associate Professor	Materials Science and Engineering
Yachnis, Anthony	Professor	Pathology, Immunology and Laboratory Medicine
Yamamoto, Janet	Professor	Veterinary Medicine
Yan, Liqing	Assistant Professor	Mathematics
Yang, Liuqing	Associate Professor	Electrical and Computer Engineering
Yang, Mark	Professor	Statistics
Yang, Thomas	Professor	Biochemistry and Molecular Biology
Yang, Weihua	Assistant Professor	Food Science and Human Nutrition
Yanong, Roy	Associate Professor	Fisheries and Aquatic Sciences
Yavuz, Tuba	Research Assistant Scientist	Computer and Information Science and Engineering
Yelich, Joel	Associate Professor	Animal Sciences
Yelton, John	Professor	Physics
Yezierski, Robert	Professor	Dentistry
Yin, Li	Research Assistant Professor	Pathology, Immunology and Laboratory Medicine
Yin, Yafeng	Assistant	Civil and Coastal Engineering

	Professor	
Yoon, Saun-Joo	Associate Professor	Nursing
Yost, Richard	Professor	Chemistry
Young, Alyson	Assistant Professor	Anthropology
Young, David	Graduate Research Professor	Theatre and Dance
Young, David	Professor	Classics
Young, Linda	Professor	Statistics
Young, Mary	Clinical Associate Professor	Behavioral Science and Community Health
Young, Vaneica	Associate Professor	Chemistry
Yu, Simon	Professor Emeritus	Entomology and Nematology
Zachmann, Gayle	Associate Professor	Language, Literature and Culture
Zapletal, Jindrich	Professor	Mathematics
Zarin, Daniel	Professor	Forest Resources and Conservation
Zazueta, Fedro	Professor	Agricultural and Biological Engineering
Zettler, Francis	Professor	Plant Pathology
Zhang, Jianhui	Professor	Tourism, Recreation, and Sport Management
Zhang, Lei	Assistant Professor	Mathematics
Zhang, Shouan	Assistant Professor	Plant Pathology
Zhang, Yi	Assistant Scientist	Pharmacology and Therapeutics
Zhao, Xin	Assistant Professor	Horticultural Science
Zhou, Lei	Associate Professor	Molecular Genetics and Microbiology
Ziegler, Kirk	Assistant Professor	Chemical Engineering
Zimmel, Dana	Clinical Associate Professor	Veterinary Medicine
Zimmerman, Andrew	Assistant Professor	Geological Sciences
Zmuda, Henry	Associate Professor	Electrical and Computer Engineering
Zoltek, John	Professor	Environmental Engineering Sciences
Zori, Roberto	Professor	Pathology, Immunology and Laboratory Medicine

Zou, Hui	Associate Professor	Architecture
Zsembik, Barbara	Associate Professor	Sociology
Zwick, Paul	Professor	Urban and Regional Planning

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Accounting

Warrington College of Business Administration

Graduate Faculty

Director: G. A. McGill. *Graduate Coordinators:* D. DeSantiago, S. Asare.
Complete faculty listing by department: Follow this link

The Fisher School of Accounting offers graduate work leading to the Master of Accounting (M.Acc.) degree with a major in accounting, and the Ph.D. degree with a major in business administration and an accounting concentration.

Master of Accounting: Three variations of the Master of Accounting degree program are available. These allow students the freedom to design an individualized plan of study in the areas of financial accounting, auditing, taxation, and cost and managerial accounting. Minimum admission requirements include an acceptable score on the Graduate Management Admission Test (GMAT), with a minimum score of 550 and completion of essays with a minimum score of 4. International students must submit a satisfactory score on the following: TOEFL (Test of English as a Foreign Language: computer-based=230 , internet-based=86). Additional information, including minimum GPA standards for admission, may be viewed at http://www.warrington.ufl.edu/fsoa/programs.

Combined degree program: The recommended curriculum to prepare for a professional career in accounting is the 3/2 five-year program with a joint awarding of the Bachelor of Science in Accounting and Master of Accounting degrees upon completion of the 150-hour program. The entry point into the 3/2 program is the

beginning of the senior year.

Traditional Master of Accounting program: Students who have already completed an undergraduate degree in accounting may enter the 1-year M.Acc. degree program which requires satisfactory completion of 34 hours of course work. A minimum of 28 credits must be in graduate-level courses; a minimum of 18 credits must be in graduate-level accounting courses. The remaining credits are selected from recommended elective courses that vary by area of specialization. Students are cautioned to seek early advisement, since many graduate courses are offered only once a year.

J.D./M.Acc. program: A joint program leading to the Juris Doctor and Master of Accounting degrees is offered by the Fisher School of Accounting and Levin College of Law. Specific details for the M.Acc., J.D./M.Acc., and Ph.D. programs are available at http://www.warrington.ufl.edu/fsoa/programs/jdmacc/

Doctor of Philosophy: The Ph.D. program offers a broad-based interdisciplinary training that prepares students to conduct both empirical and analytical research. The curriculum consists of course work of four types: the major field, a breadth requirement, a research foundation requirement, and a minor or supporting field. In addition, students must demonstrate competence in conducting research and teaching, and must complete a dissertation on an accounting topic.

The major field in accounting consists of at least 18 credit hours of course work including research analysis, archival research, analytical research, experimental research, readings, and a research project. The breadth requirement consists of at least 13 credit hours of course work including microeconomic theory, corporate finance theory, game theory, asset pricing, and information economics. The research foundation requirement consists of at least 12 hours of graduate course work in mathematical economics, statistics, or econometrics. The minor or supporting field requirement is met by completing a minimum of 12 hours of graduate course work in the selected field.

Students demonstrate competency in conducting research by completing a research project in the summers of the first and second year. The teaching competence is demonstrated by completing at least 1 hour (but no more than 5 hours) of supervised teaching, and by teaching for at least 2 semesters. Admission requirements include a history of academic excellence, adequate score on the GMAT (the average score of recently admitted applicants is 690 for GMAT), competence in written and spoken English (TOEFL Internet-Based test (iBT) required for applicants whose native language is not English), appreciation of accounting issues, and institutional and math competency.

ACG 5005: Financial Accounting(2)** Introduction for prospective managers. Primary emphasis on financial reporting and analysis.

ACG 5065: Financial and Managerial Accounting (3) *Prereq: designed for MBA students.* Financial statement analysis including techniques, cash flow, and impact of accounting principles. Management control systems: planning, budgeting, reporting, analysis, and performance evaluation.

ACG 5075: Managerial Accounting(2) *Prereq: ACG 5005.* Introduction for prospective managers. Primary emphasis on management control systems.

ACG 5226: Mergers and Acquisitions and Consolidated Statements(2) Reporting of business combinations, equity method of accounting for investments in stocks, and issues concerning consolidated financial statements.

ACG 5505: Financial Reporting for Governmental and Not-for-Profit Organizations(2) *Prereq: ACG 4133C, 7AC standing.* Reporting by state and local governmental organizations and not-for-profit entities.

ACG 5637: Auditing I (3) *Prereq: C grade or better in ACG 4133C and in ACG 4352C; and AC standing.* Introduction to auditing and assurance services. Decision-making process, research, and auditing standards and procedures, with emphasis on ethics, legal liability, internal control, audit evidence, testing, and introduction to statistical sampling and EDP auditing.

ACG 5815: Accounting Institutions and Professional Literature(2) *Prereq: ACG 4133C, 5637, 7AC standing.* Private and public sector accounting institutions and their respective professional literature. Research techniques for addressing accounting issues emphasized through case assignments.

ACG 6136: Accounting Concepts and Financial Reporting(2) *Prereq: ACG 5815, 7AC standing.* Theoretical frameworks essential to explore structure, features, and limitations of accounting and financial reporting.

ACG 6207: Accounting Issues in Financial Risk Management(2) *Prereq: ACG 5815, 5226, 7AC standing.* Overview of risk management, financial instruments used in risk management, and related accounting issues and practices.

ACG 6255: International Accounting Issues(2) *Prereq: ACG 5815, 5226, 7AC standing.* Overview of international accounting and financial reporting practices in foreign jurisdictions and comparisons of financial reporting requirements between United States and selected foreign countries.

ACG 6265: International Accounting and Taxation(2) *Prereq: ACG 2021C or 5005; not open to students majoring in accounting.* Introduction to international accounting and tax concepts from a financial statement user's perspective.

ACG 6387: Strategic Costing(2) *Prereq: graduate standing.* Strategic view of design and use of an organization's internal accounting system.

ACG 6635: Issues in Audit Practice(2) *Prereq: ACG 5815, 5226,*

7AC standing. In-depth discussion of fundamental concepts underlying audit practice, including introduction to current topics in auditing, advanced audit methods, and trends in auditing practice.
ACG 6657: Auditing and Corporate Governance(2) *Prereq: ACG 5226, 5815, 7AC standing.* Concepts of corporate governance including regulation and practice. Overview of corporate governance mechanisms and introduction to economic foundation for auditing; linkages among governance, risk management and assurance; and essential attributes of auditing such as independence.
ACG 6695: Computer Assurance and Control(2) *Prereq: ACG 5637, 7AC standing.* Concepts of risk, control, and assurance in environments with advanced information technology. Technology based audit tools and techniques.
ACG 6888: Foundations of Measurement(2) *Prereq: graduate standing.* Foundations of measurement: whether measure exists, uniqueness properties if it does exist, and implementation issues. Measures of income, of value, of preference, and of risk.
ACG 6905: Individual Work in Accounting(1-4; max: 7) *Prereq: approval of graduate coordinator.* Reading and research in areas of accounting.
ACG 6935: Special Topics in Accounting(1-4; max: 8) *Prereq: consent of associate director.*
ACG 6940: Supervised Teaching(1-5; max: 5) S/U.
ACG 7885: Accounting Research I (; max: 4)
ACG 7886: Accounting Research II (4) Theoretical constructs in accounting, valuation models, information asymmetry and production, and nonmarket information use.
ACG 7887: Research Analysis in Accounting(3) *Prereq: ACG 7886.* Analysis of accounting research and presentation of student research project results. Financial accounting, managerial accounting, auditing, taxation, management information systems, and information economics.
ACG 7939: Theoretical Constructs in Accounting(3) *Prereq: ACG 7886.* Emerging theoretical issues that directly impact research and development of thought in accounting. Theory construction and verification, information economics, and agency theory constitute subsets of this course.
ACG 7979: Advanced Research(1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
ACG 7980: Research for Doctoral Dissertation(1-15) S/U.
TAX 5005: Introduction to Federal Income Taxation (3) *Prereq: C grade or better in ACG 3482C; and AC standing.* Concepts and applications for all types of taxpayers. Influence of taxation on economic decisions, basic statutory provisions relevant to determining taxable gross income, allowable deductions, tax computations, recognition or nonrecognition of gains and losses on property transactions, and characterization of gains and losses.
TAX 5065: Tax Professional Research (2) *Prereq: TAX 5005,*

7AC standing. Use of professional tax literature and technology for problem solving. Case-based to provide experience in dealing with unstructured situations encountered in professional tax practice. Emphasizes problem identification and resolution.

TAX 6015: Taxation of Business Entities I (2) *Prereq: TAX 5065, 7AC standing.* First of a 3-course sequence examining taxation of corporations, S corporations, partnerships, and other business entities. Emphasizes tax planning and comparisons of taxation across entity forms, in addition to basic taxation of business entities.

TAX 6016: Taxation of Business Entities II(2) *Prereq: TAX 6015, 7AC standing.* Continuation of TAX 6015.

TAX 6017: Taxation of Business Entities III(2) *Prereq: TAX 6016, 7AC standing.* Continuation of TAX 6016.

TAX 6526: Advanced International Taxation(2) *Prereq: TAX 5065, 7AC standing.* Expansion of introduction to international tax, addressing more complex concepts encountered by U.S. multinationals operating abroad. U.S. taxation of foreign persons with U.S. activities included.

TAX 6726: Executive Tax Planning(2) *Prereq: TAX 5065, 7AC standing.* Unique economic and tax planning scenarios faced by highly compensated executives throughout their working lives and as they face retirement and death.

TAX 6877: Multijurisdictional Taxation(2) *Prereq: TAX 5065, 7AC standing.* Tax issues involved when business enterprises operate in multiple taxing jurisdictions. Principles of both multi-state and international income taxation (and their overlap).

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African Studies

College of Liberal Arts and Sciences

Graduate Faculty

Director and Graduate Coordinator: L. Villalon.
Complete faculty listing by department: Follow this link

The Center of African Studies offers the Certificate in African Studies for master's and doctoral students in conjunction with disciplinary degrees. Graduate courses on Africa or with African content are available in the Colleges, Schools, or Departments of Agricultural and Life Sciences, Anthropology, Art and Art History, Botany, Economics, Education, English, Food and Resource Economics, Forest Resources and Conservation, Geography, History, Journalism and Communications, Law, Linguistics, Music, Political Science, and Sociology. The Certificate Program in African Studies is described in the *Special Programs* section of this catalog. Course offerings are listed by academic unit in this catalog, or may be obtained from the Director, 427 Grinter Hall.

AFS 5061: Africana Bibliography(1) Survey of advanced reference, specialized research tools (including variety of electronic databases, published paper indexes, and bibliographies), and methods for graduate-level research in all disciplines of African area studies.
AFS 6060: Research Problems in African Studies(3) Interdisciplinary seminar on creating individual research designs and preparing funding proposals for research in Africa.
AFS 6905: Individual Work (1-3; max: 9)

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Agricultural and Biological Engineering

Colleges of Engineering and Agricultural and Life Sciences

Graduate Faculty

Chair: D. Z. Haman. *Graduate Coordinator:* R. A. Buckley.
Complete faculty listing by department: Follow this link

The degrees of Master of Science, Master of Engineering, Doctor of Philosophy, and Engineer are offered with graduate programs in agricultural and biological engineering through the College of Engineering. The Master of Science and Doctor of Philosophy degrees in agricultural and biological engineering are offered in the areas of agricultural operations management and applied science through the College of Agricultural and Life Sciences. Requirements for these degrees are given in the *General Information* section of this catalog.
Additional information can be found on the graduate studies pages on the department website at www.abe.ufl.edu.

A combined B.S./M.S. program allows up to 12 graduate credits to be double counted toward fulfillment of both degrees. Contact the graduate coordinator for qualifications and details. A 30-credit, 3-semester nonthesis master's degree program is also available to students interested in completing the requirements in 1 year.

The Master of Science, Master of Engineering, and Doctor of Philosophy degrees are offered in the following areas of research:

Agricultural production includes development and application of precision agriculture concepts and tools, climate risk in agriculture,

pesticide application, robotics and other machine systems and environmental control systems. Applications to space agriculture are included in cooperation with NASA at Kennedy Space Center.

Biological engineering includes post-harvest operations, bioprocess design, plant biotechnology, process microbiology, food process engineering, environmental biotechnology, bioreactors, and packaging science.

Information systems includes development and application of GIS and remote sensing, communications, mathematical modeling, environmental decision analysis and expert systems techniques to biological and agricultural systems.

Land and water resources includes soil-water-plant relations, irrigation, water quality, watershed hydrology, BMP and TMDL studies, hydrologic modeling, ecological restoration, environmental fate and transport of nanoparticles, waste management, ecological and risk modeling and water reuse.

Students also may choose to participate in interdisciplinary concentrations in hydrologic sciences, geographic information sciences, particle science and technology, and interdisciplinary ecology.

The Master of Science and Doctor of Philosophy in the agricultural operations management area of specialization provide for scientific training and research in technical agricultural management. Typical plans of study focus on advanced training in environmental systems management, production systems management, construction and process management and technical sales management.

For students with basic science degrees, the Doctor of Philosophy program with a specialization in applied sciences through the College of Agricultural and Life Sciences provides advanced training in problem-solving capabilities, interdisciplinary research, and methods for applying science to real-world problems and issues. Typical emphasis is on (1) the use of engineering methods and approaches, such as mathematical modeling, optimization, and information technologies, in application of science to problems of various spatial and temporal scales; and (2) an interdisciplinary experience in research at the doctoral level.

The requirements for a master's degree normally take 2 years to complete. The length of time required for the Doctor of Philosophy degree depends partly on the research topic, but normally takes 3 to 4 years.

ABE 5015: Empirical Models of Crop Growth and Yield Response (3) *Prereq: consent of instructor.* Analytical models

useful for engineering design and management decisions, including water reuse. Emphasis on analytical functions. Modeling strategy based on patterns of data, functional relationships, connections among various factors, consistency among data sets, and mathematical beauty.

ABE 5032: Programming and Interfacing High-Performance Microcontrollers(3) *Prereq: experience in programming. Not available for students with credit in ESI 4161 and EEL 4744C.* Design of high-performance, embedded, microcontroller-based control systems with emphasis on integrating hardware, software, and applications interfacing. Hands-on experiments illustrate and reinforce principles.

ABE 5152: Electro-Hydraulic Circuits and Controls(2) *Prereq: EML 3100, EGM 3400, 3520.* Engineering analysis, design, and experimentation of electro-hydraulic circuits and systems. Design of hydraulic circuits, fluid power system components, hydraulic actuator analysis, servo and proportional valve performance, and electro-hydraulic control theory and applications.

ABE 5332: Advanced Agricultural Structures (3) Design criteria for agricultural structures including steady and unsteady heat transfer analysis, environmental modification, plant and animal physiology, and structural systems analysis.

ABE 5442: Advanced Agricultural Process Engineering (3) Engineering principles, processes, and techniques for using biological agents for production of chemicals, food, biofuels, and pharmaceuticals, and waste treatment.

ABE 5643C: Biological Systems Modeling (3) *Prereq: MAC 2312.* Introduction to concepts and methods of process-based modeling of biological systems; physiological, populational, and agricultural applications.

ABE 5646: Biological and Agricultural Systems Simulation (3) *Prereq: MAC 2312, STA 3032 or STA 4322. Coreq: GCC approved 10/22/07 and forwarded to registrar.* Basic concepts of systems analysis, modeling, and computer simulation of dynamic biological and agricultural systems. Methods for working with models, including sensitivity analysis, parameter estimation, and model evaluation. Applications of models in agricultural and biological systems.

ABE 5653: Rheology and Mechanics of Agricultural and Biological Materials (3) *Prereq: MAC 2313, PHY 2048, CHM 2045, or consent of instructor.* Relation of biophysical and biochemical structure to rheological and mechanical behavior of biological materials in solid, liquid, and granular form; methods for measuring material properties governing these behaviors.

ABE 5663: Advanced Applied Microbial Biotechnology (3) *Prereq: general biology and organic chemistry, or consent of instructor.* Principles of microbial biotechnology, emphasizing the application of microorganisms for industrial processes (e.g., energy, environmental, food, pharmaceutical, and chemical).

ABE 5707C: Agricultural Waste Management (3) *Prereq: 4 or higher classification.* Engineering analysis and design of systems for

the collection, storage, treatment, transport, and utilization of livestock and other agricultural organic wastes and wastewaters. Field trips to operating systems and laboratory evaluation of materials and processes.

ABE 5815C: Food and Bioprocess Engineering Design (4) Engineering design of unit process operations employed in agro/food, pharmaceutical, and biological industries including sterilization/pasteurization, radiation, freezing, drying, evaporation, fermentation, distillation.

ABE 6005: Applied Control for Automation and Robots (3) *Prereq: EML 5311.* Introduction to industrial controls, programmable logic controllers, and manipulator application programming in agricultural and biological engineering. Kinematics, dynamics, and control strategies for serial link manipulators in agricultural applications.

ABE 6031: Instrumentation in Agricultural Engineering Research (3) Principles and application of measuring instruments and devices for obtaining experimental data in agricultural engineering research.

ABE 6035: Advanced Remote Sensing: Science and Sensors (3) *Prereq: MAP 2302.* Develops understanding of remote sensing theory and systems using information obtained from visible/near infrared, thermal infrared, and microwave regions of the EM spectrum.

ABE 6252: Advanced Soil and Water Management Engineering (3) Physical and mathematical analysis of problems in infiltration, drainage, and groundwater hydraulics.

ABE 6254: Simulation of Agricultural Watershed Systems (3) *Prereq: CWR 4111 and working knowledge of FORTRAN.* Characterization and simulation of agricultural watershed systems including land and channel phase hydrologic processes and pollutant transport processes. Investigation of the structure and capabilities of current agricultural watershed computer models.

ABE 6262C: Remote Sensing in Hydrology (3) *Prereq: ABE 6035.* Develops practical understanding of remote sensing applications to hydrology using observations in different regions of the EM spectrum. Seminar style with emphasis on literature review and presentation.

ABE 6615: Advanced Heat and Mass Transfer in Biological Systems (3) *Prereq: CGS 2425, ABE 3612C.* Analytical and numerical technique solutions to problems of heat and mass transfer in biological systems. Emphasis on nonhomogeneous, irregularly shaped products with respiration and transpiration.

ABE 6644: Agricultural Decision Systems (3) Computerized decision systems for agriculture. Expert systems, decision support systems, simulations, and types of applications in agriculture.

ABE 6794: Nonthesis Project(1-6; max: 6) In-depth project. S/U.

ABE 6816: Food and Bioprocess Sterilization (3) Analysis of available process technologies for sterilization in the food, pharmaceutical and biotechnology industries.

ABE 6905: Individual Work in Agricultural and Biological Engineering (1-4; max: 6) Special problems in agricultural engineering.
ABE 6910: Supervised Research (1-5; max: 5) S/U.
ABE 6931: Seminar (1; max: 2) Preparation and presentation of reports on specialized aspects of research in agricultural engineering and agricultural operations management. S/U.
ABE 6933: Special Topics in Agricultural and Biological Engineering (1-4; max: 6) Lectures, laboratory, and/or special projects.
ABE 6940: Supervised Teaching (1-5; max: 5) S/U.
ABE 6971: Research for Master's Thesis (1-15) S/U.
ABE 6972: Research for Engineer's Thesis (1-15) S/U.
ABE 6974: Nonthesis Project(1-6; max: 6) In-depth project. S/U.
ABE 6986: Applied Mathematics in Agricultural and Biological Engineering (3) Mathematical methods, including regression analysis, graphical techniques, and analytical and numerical solution of ordinary and partial differential equations, relevant to agricultural engineering.
ABE 6XXX: Vadose Zone Modeling(3) *Prereq: None. Recommended basic use of high level computer language or numerical computing environment (i.e., Matlab, Mathematica, etc.) that allows the student to test algorithms and read existing modeling source code.* Unsaturated zone modeling of water flow and solute transport processes. Comparative analysis of alternative mechanistic modeling approaches of different complexity.
ABE 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
ABE 7980: Research for Doctoral Dissertation (1-15) S/U.
AOM 5315: Advanced Agricultural Operations Management (3) *Prereq: AOM 4455; CGS 2531 or equivalent or consent of instructor.* The functional and economic applications of machine monitoring and robotics. Analysis of farm machinery systems reliability performance. Queuing theory, linear programming, and ergonomic considerations for machine systems optimization.
AOM 5334C: Agricultural Chemical Application Technology(3) Equipment and methods used to apply pesticides in agriculture. Emphasis on techniques to avoid misapplication and pesticide drift.
AOM 5431: GIS and Remote Sensing in Agriculture and Natural Resources (3) *Prereq: working knowledge of computer or consent of instructor.* Principles and applications of geographic information systems (GIS) and global positioning system (GPS) technologies supporting land use/cover assessment, agricultural production, and natural resource conservation.
AOM 5435: Advanced Precision Agriculture (3) Principles and applications of technologies supporting precision farming and natural resource data management planning. Global positioning systems

(GPS), geographic information systems (GIS), variable rate technologies (VRT), data layering of independent variables, automated guidance, Internet information access, computer software management.

AOM 6905: Individual Work in Agricultural Operations Management (1-6; max: 6) Special problems.

AOM 6932: Special Topics in Agricultural Operations Management (1-6; max: 6) Lectures, laboratory, and /or special projects.

CWR 6536: Stochastic Subsurface Hydrology (3) *Prereq: senior-level course in probability and statistics, calculus through differential equations, soil physics, and/or subsurface hydrology.* Stochastic modeling of subsurface flow and transport including geostatistics, time series analysis, Kalman filtering, and physically based stochastic models.

PKG 5002: Advanced Packaging, Society, and the Environment(3) Evolution of modern society and its relationship to packaging, technology, and both real and popular environmental concerns.

PKG 5003: Advanced Distribution and Transport Packaging(3) Containment, protection, and preservation related to transporting and distributing packaging products. Methods for efficient scheduling and directing transport and delivery of packages.

PKG 5006: Advanced Packaging Principles (3) *Prereq: chemistry, physics, or biology.* Modern lab instruments and procedures employed for packaging used to solve problems from packaging industry.

PKG 5007: Advanced Packaging Materials(3) Major packaging materials, forms, and strategies. Specific issues related to packaging composition and form.

PKG 5105: Advanced Consumer Products Packaging (3) Major packaging methods, materials, forms, and strategies used for consumer products. Packaging plans with associated mock-ups for proposed consumer product are prepared as specific team projects.

PKG 5206C: Advanced Package Decoration (3) Major decoration methods used for packaging. Student teams create original graphic designs and execute designs on 200 containers.

PKG 5256C: Advanced Analytical Packaging Methods (3) Materials, uses, functions, and production processes of packaging. Historical, societal, and technological drivers of packaging.

PKG 6100: Advanced Computer Tools for Packaging(3) Label design, bar code technology, spreadsheets, visual basic programming, 3D package design, and distribution efficiency analysis.

PKG 6905: Individual Work in Packaging (1-6; max: 6) Special problems in packaging sciences.

PKG 6932: Special Topics in Packaging Sciences (1-6; max: 6) Lectures, laboratory, and/or special projects.

SWS 6535: Vadose zone water and solute transport modeling () Unsaturated zone modeling of water flow and solute transport processes. Comparative analysis of alternative mechanistic modeling

approaches of different complexity.

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Agricultural Education and Communication

College of Agricultural and Life Sciences

Graduate Faculty

Chair: E. W. Osborne. *Graduate Coordinator:* T. A. Irani.
Complete faculty listing by department: Follow this link

The Department of Agricultural Education and Communication offers major work for the degrees of Doctor of Philosophy and Master of Science, and a distance-delivered Master of Science degree. Requirements for these degrees are given in the *General Information* section of this catalog. The Doctor of Philosophy degree program prepares graduates for academic positions in teaching, research, and extension within the realm of agricultural education and communication. In addition, graduates may obtain positions in administration, human resource management, or training and development. There are four areas of specialization: agricultural communication, agricultural education, extension education, and leadership development. Doctoral candidates develop an individual program of study that provides a comprehensive knowledge of the teaching and learning processes. Furthermore, this degree program is research and theory-based, focusing on research opportunities and experiences that enhance the depth and breadth of the candidate's prior learning opportunities.

Students in the agricultural communication specialization develop strong skills and application in media writing, production, campaign strategies, and Web design and desktop publishing. Graduates are prepared for professional communication careers in (or dealing with) agriculture and agribusiness related to public value, positioning, and marketing.

The doctoral program in agricultural education is research-oriented, focusing on preparing candidates to assume faculty positions in colleges or university teacher-education programs.

Graduates of the extension education specialization acquire depth in the teaching and learning processes, gaining experience in designing, implementing, and evaluating nonformal education programs. Moreover, students' course work and research prepare them for careers in the Cooperative Extension Service, outreach education, and international agencies.

The leadership development specialization focuses on leadership theory and measurement, critical and creative thinking, and leadership in cross-cultural settings. Graduates are prepared for educational leadership, training, and outreach positions in agricultural extension, community, and governmental agencies.

The Master of Science degree includes four specializations. The agricultural communication specialization prepares students for professional communication careers in or dealing with agriculture, agribusiness, or natural resources and provides a foundation for further study at the doctoral level. It is mainly for students who enter with a bachelor’s degree in journalism, agricultural journalism, advertising, broadcasting, public relations, or related fields.

The agricultural leadership education specialization prepares students for educational leadership, training, and outreach positions in agricultural, extension, community, and governmental agencies.

The agricultural extension specialization is designed to enhance the careers of those employed in the Cooperative Extension Service, including family and consumer sciences, agriculture, 4-H, and other related areas. Students gain valuable knowledge and experience in designing, implementing, and evaluating educational programs.

The agricultural education specialization gives the student tremendous depth in the teaching and learning process. Students can be certified to teach in the state of Florida through this program.

The Distance Delivered Master of Science program is specifically designed to meet the needs of practicing extension county agents, and middle and high school agriscience teachers. All courses are offered via Web delivery and the program takes approximately two and a half years to complete. The course schedule and content are tailored to best meet the needs of practicing educators. A written final exam and project are required in lieu of a thesis.

A prospective graduate student need not have majored in agricultural education and communication as an undergraduate.

However, students with an insufficient background in either agricultural education or technical agriculture will need to include some basic courses in these areas in their program. The Department offers a combined bachelor's/master's program. Contact the graduate coordinator for information.

AEC 5544: Curriculum Development and Assessment Techniques in Emerging Agricultural Technologies (3) Principles and practices used in developing agricultural education curriculum from developing objectives through instructional plans. Assessing student learning and implementing curriculum.

AEC 5545: Special Methods in Teaching Agriculture (3) Teaching methods for active learning, critical, creative and evaluative thinking in the agricultural education classroom. Strategies for managing student behavior, utilizing instructional technology and utilizing FFA and SAE as teaching tools.

AEC 5546: Program Planning in Agricultural Education (3) Principles and practices used in designing agricultural education program plans for effective and total program development.

AEE 5032: Agricultural Media Writing(3) *Prereq: AEE 5541.* Varied media writing assignments: feature stories, news releases, and video.

AEE 5037: Agricultural Media Production (3) *Prereq: AEE 5541.* Various agricultural media production assignments. Developing agricultural websites and publications.

AEE 5060: Public Opinion and Agricultural and Natural Resource Issues (3) Public opinion measurement and agenda setting. Media treatment, public opinion, and public relations/public information activity on issues affecting agricultural production and trade.

AEE 5073: Agriculture, Resources, People, and the Environment: A Global Perspective (3) Interdependence in the global context, and the need to cultivate a lifelong global perspective.

AEE 5301: Professional Skill Development in Agriscience Education I(1-3; max: 9) *Prereq: teaching experience.* Development and enhancement of technical agricultural and scientific knowledge and skills by professional agriscience teachers.

AEE 5454: Leadership Development for Extension and Community Nonprofit Organizations (3) Application of concepts related to developing leaders for organizing and maintaining extension and community nonprofit organizations.

AEE 5500: Professional Skill Development in Agriscience Education II (1-3; max: 9) *Prereq: AEE 5301.* Advanced level of development and enhancement of technical agriculture and scientific knowledge and skills by professional agriscience educators.

AEE 5541: Communication and Instructional Technologies in Agricultural and Life Sciences (3) Planning and producing written and visual instructional and communication materials for programs in the agricultural and life sciences. Requires a major instructional project or communication campaign.

AEE 6229: Laboratory Instruction: Theory and Practice (3) Research and theoretical foundations underlying the aspects of planning, management, teaching, evaluation, safety, and facility design: discussed in the context of laboratory instruction.

AEE 6300: Methodology of Planned Change (3) Processes by which professional change agents influence the introduction, adoption, and diffusion of technological changes. Applicable to those who are responsible for bringing about change.

AEE 6316: From America to Zimbabwe: An Overview of International Extension Systems(3) Various extension models and delivery systems, extension partners; linkages and issues affecting extension internationally. Field trip.

AEE 6325: History and Philosophy of Agricultural Education (3) Analysis of evolving concepts and philosophies. Emphasis on history, legislation, and principles underlining organization and practice. Participation in field experience required.

AEE 6419: Communication and Competencies for Global Leadership (3) Identifying and developing the personal and professional competencies required for effective leadership in an increasingly global society. International communication is included.

AEE 6426: Development of a Volunteer Leadership Program (3) Identification, recruitment, training, retention, and supervision of volunteer leaders.

AEE 6512: Program Development in Extension Education (3) Concepts and processes drawn from the social sciences that are relevant to the development of extension education programs.

AEE 6540: Agricultural and Natural Resources Communications Theory and Strategies(3) Communication theory and concepts as they apply to important agricultural/natural resources issues.

AEE 6542: Teaching and Learning Theory: Applications in Agricultural Education (3) *Prereq: AEE 5206.* Contemporary and foundational theory and research on teaching and learning.

AEE 6552: Evaluating Programs in Extension Education (3) Concepts and research drawn from the social sciences relevant to evaluating youth and adult extension programs.

AEE 6611: Agricultural and Extension Adult Education (3) Concepts and principles related to design, implementation, and evaluation of education programs for adults.

AEE 6704: Extension Administration and Supervision (3) Principles and practices for effective administration and supervision of the cooperative extension service program at the county and state levels.

AEE 6767: Research Strategies in Agricultural Education and Communication (3) Application of principles, practices, and strategies for conducting behavioral research in agricultural and natural resource professions.

AEE 6905: Problems in Agricultural and Extension Education (1-3; max: 8) *Prereq: consent of department chair.* For advanced students to select and study a problem related to agricultural and/or extension education.

AEE 6910: Supervised Research (1-5; max: 5) S/U.
AEE 6912: Nonthesis Research in Agricultural and Extension Education (1-3; max: 6) Library and workshop related to methods in agricultural and extension education, including study of research work, review of publications, development of written reports.
AEE 6933: Seminar in Agricultural Education and Communication (1; max: 3) Exploration of current topics and trends.
AEE 6940: Supervised Teaching (1-5; max: 5) S/U.
AEE 6945: Practicum in Agricultural Education and Communication (1-3; max: 6) Supervised experience appropriate to the student's professional and academic goals.
AEE 6971: Research for Master's Thesis (1-15) S/U.
AEE 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
AEE 7980: Research for Doctoral Dissertation (1-15) S/U.
AGG 5504: Critical and Creative Thinking in Problem Solving and Decision Making(3) Critical and creative thinking skills applied to agricultural, life sciences, and natural resources problem solving and decision making.
ALS 5032: Teaching in Colleges of Agricultural and Life Sciences (3) *Prereq: graduate standing.* Theories, principles, and practices associated with effective teaching and learning in higher education.

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Agriculture--General

College of Agricultural and Life Sciences

Dean: R. K. Barrick.

The College of Agricultural and Life Sciences offers academic programs and grants advanced degrees in 17 departments and the Schools of Forest Resources and Conservation, and Natural Resources and Environment. These academic units are all a part of the Institute of Food and Agricultural Sciences (IFAS). Additional components of IFAS include 16 research centers located throughout the state and cooperative extension offices in each of the 67 counties of the state.

The following courses are offered under the supervision of the office of the dean by an interdisciplinary faculty and deal with material of concern to two or more IFAS academic units. The courses are also open to students of other colleges, with the permission of the course instructor.

ALS 5036: Contemporary Issues in Science (2) Current issues in science as related to students pursuing scientific careers. Discussion topics focus on issues of graduate education, funding for science, job markets, scientific research ethics, publication, and job expectations. Offered spring term. S/U.
ALS 5106: Food and the Environment (3) Relationship between food production and consumption and environmental quality. Scientific merits of controversies about impact of food production on environment and of different production strategies and practices. Biodiversity, water quality, soil resources, ecological economics, and energy use in food production. Taught interactively on Internet in

even-numbered years.

ALS 5364C: Molecular Techniques Laboratory(2) Current protocols in molecular biology techniques.

ALS 5905: Individual Study (1-4; max: 6) Supervised study or research not covered by other courses.

ALS 5932: Special Topics (1-4; max: 6)

ALS 6046: Grant Writing (2) *Prereq: admitted to doctoral program.* Preparation, submission, and management of competitive grants, including operations of national review panels and finding sources of extramural funding.

ALS 6921: Colloquium on Plant Pests of Regulatory Significance (1; max: 3) *Prereq: for students in PPRAM certificate program.* On-going colloquium series involving information on important emerging plant pests. S/U.

ALS 6925: Integrated Plant Medicine (4) *Prereq: all core courses for DPM degree.* Review and synthesis of the principles of plant-problem prevention, diagnosis, and management.

ALS 6930: Graduate Seminar (1; max: 4) Topics in agriculture and/or natural resources. S/U option.

ALS 6931: Plant Medicine Program Seminar (1; max: 3) *Prereq: DPM student or consent of instructor.* On-going seminar series involving presentations on plant-health management. S/U.

ALS 6942: Principles of Plant Pest Risk Assessment and Management (3) *Prereq: for students in PPRAM certificate program.* Plant pest risk estimation and how mitigation strategies are developed and implemented.

ALS 6943: Internship in Plant Pest Risk Assessment and Management (1-10; max: 15) *Prereq: for students in PPRAM certificate program.* Internships conducted with personnel involved in plant pest risk assessment and management. S/U.

BCH 5045: Graduate Survey of Biochemistry (3) *Prereq: inorganic chemistry, organic chemistry, biology.* Introduction to plant, animal, and microbial biochemistry for graduate students who have not had biochemistry. Integration and regulation of biochemical processes stressed; limited discussion of some biochemical techniques.

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Agronomy

College of Agricultural and Life Sciences

Graduate Faculty

Chair: J. M. Bennett. *Graduate Coordinator:* L. E. Sollenberger.
Complete faculty listing by department: Follow this link

The Department offers the degrees of Doctor of Philosophy and Master of Science (thesis and nonthesis option) in agronomy with specialization in crop ecology, crop nutrition and physiology, crop production, weed science, genetics, or plant breeding. Requirements for these degrees are given in the *General Information* section of this catalog.

Graduate programs emphasize the development and subsequent application of basic principles in each specialization to agronomic plants in Florida and throughout the tropics. The continuing need for increased food supplies is reflected in departmental research efforts. When compatible with a student's program and permitted by prevailing circumstances, some thesis and dissertation research may be conducted wholly or in part in one or more of several tropical countries.

A science background with basic courses in mathematics, chemistry, botany, microbiology, and physics is required of new graduate students.

AGR 5215C: Integrated Field Crop Science (3) Intensive introduction to practical field crop production and management of common, as well as under-exploited, field crops. Offered summer A term.

AGR 5230C: Florida Grassland Agroecosystems (4) Comprehensive overview of planted and native grassland ecosystems in Florida emphasizing their growth, species diversity, management, and use by ruminant animals. Offered spring term.

AGR 5266C: Field Plot Techniques (3) *Prereq: STA 3023.* Techniques and procedures used in design and analysis of field plot, greenhouse, and laboratory research experiments. Application of research methodology, the analysis and interpretation of research results. Offered fall term.

AGR 5277C: Tropical Crop Production (3) *Prereq: consent of instructor.* Ecology and production practices of selected crops grown in the tropics. Offered spring term.

AGR 5307: Molecular Genetics for Crop Improvement (3) *Prereq: AGR 3303.* Lectures and laboratory demonstrations for a thorough understanding of concepts and applied aspects of plant molecular and cellular biology. Discussion of current research in plant biotechnology and functional genomics. Offered spring term.

AGR 5321C: Genetic Improvement of Plants (3) *Prereq: AGR 3303.* Genetic basis for crop improvement including methods for improving crop yield, pest resistance, and adaptability. Emphasis on manipulating genetic variability in self- and cross-pollinate, annual and perennial crop plants. Offered fall term.

AGR 5444: Ecophysiology of Crop Production (3) *Prereq: AGR 3005 or equivalent.* Physiological, ecological, and environmental responses that impact growth, development, and yield formation of cultivated crops. Offered spring term.

AGR 5511: Crop Ecology (3) *Prereq: AGR 4210, BOT 3503, PCB 3043C, or equivalent.* Relationships of ecological factors and climatic classifications to agroecosystems, and crop modeling of the major crops. Offered fall term.

AGR 5515: Medicinal Plant Research (3) Research on selected medicinal plants of eastern USA, including plant nutrition, ecology, and medicinal properties. Field trips to identify and collect specimens supplement laboratory exercises. Offered summer A term.

AGR 5515C: Medicinal Plant Research Lab(3) Research on selected medicinal plants of the eastern U.S., including plant nutrition, ecology, and medicinal properties. Field trips to identify and collect specimens supplement the laboratory exercises.

AGR 6233: Tropical Grassland Agroecosystems (3) *Prereq: AGR 4231C and ANS 5446 or consent of instructor.* Potential of natural grasslands of tropical and subtropical regions. Development of improved pastures and forages and their use in livestock production. Offered fall term in odd-numbered years.

AGR 6237C: Research Techniques in Forage Evaluation (3) *Prereq: STA 6166. Coreq: STA 6166.* Experimental techniques for field evaluation of forage plants. Design of grazing trials and procedures for estimating yield and botanical composition in the grazed and ungrazed pasture. Offered summer C term in odd-numbered years.

AGR 6311: Population Genetics (2) *Prereq: AGR 3303, STA 6166.*

Application of statistical principles to biological populations in relation to gene frequency, zygotic frequency, mating systems, and the effects of selection, mutation, and migration on equilibrium populations. Offered spring term in even-numbered years.

AGR 6322: Advanced Plant Breeding (3) *Prereq: AGR 3303, 4231, 6311, and STA 6167.* Theory and use of biometrical genetic models for analytical evaluation of qualitative and quantitative characteristics, with procedures applicable to various types of plant species. Offered spring term in even-numbered years.

AGR 6325L: Plant Breeding Techniques (1; max: 2) *Prereq: AGR 3303 or equivalent; coreq: AGR 6322.* Examination of various breeding techniques used by agronomic and horticultural crop breeders in Florida. Field and lab visits to active plant breeding programs, with discussion led by a specific breeder each week. Hands-on experience in breeding programs. Offered spring term in odd-numbered years.

AGR 6353: Cytogenetics (3) *Prereq: AGR 3303.* Genetic variability with emphasis on interrelationships of cytologic and genetic concepts. Chromosome structure and number, chromosomal aberrations, apomixes, and application of cytogenetic principles. Offered fall term in odd-numbered years.

AGR 6422C: Environmental Crop Nutrition (3) *Prereq: BOT 3503.* Design of cost-effective and environmentally sound crop nutrient management strategies. Diagnostic nutrient analysis, nutrient uptake, BMPs, and sustainable agriculture. Offered fall term.

AGR 6442C: Physiology of Agronomic Plants (4) *Prereq: BOT 3503.* Yield potentials of crops as influenced by photosynthetic efficiencies, respiration, translocation, drought, and canopy architecture. Plant response to environmental factors. Offered spring term.

AGR 6905: Agronomic Problems (1-5; max: 8) Special topics for classroom, library, laboratory, or field studies of agronomic plants.

AGR 6910: Supervised Research (1-5; max: 5) S/U.

AGR 6932: Topics in Agronomy (1-3; max: 8) Critical review of selected topics in specific agronomic areas.

AGR 6933: Graduate Agronomy Seminar (1; max: 3) Current literature and agronomic developments.

AGR 6940: Supervised Teaching (1-5; max: 5) S/U.

AGR 6971: Research for Master's Thesis (1-15) S/U.

AGR 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

AGR 7980: Research for Doctoral Dissertation (1-15) S/U.

IPM 5305: Principles of Pesticides (3) Basic knowledge of pesticides and their use. Practical working knowledge of pesticides used in agricultural and horticultural settings. Offered spring term.

PLS 5632C: Integrated Weed Management (3) Overview of weed science principles and practices, emphasizing strategies for

southeastern cropping systems. Situations unique to the State of Florida. Offered fall term.

PLS 5652: Advanced Weed Science (3) *Prereq: PLS 4601.* Classification, mode of action, principles of selectivity, and plant responses to herbicides. Weed, crop, environmental, and pest management associations in developing herbicide programs. Focus on practical principles. Offered fall term in odd-numbered years.

PLS 6623: Weed Ecology (3) *Prereq: PCB 3043C, PLS 4601, or equivalent.* Characteristics of weedy species. Ecological principles emphasizing interactions of weeds with their environment and neighboring plants, in crop and various noncrop habitats. Offered spring term in even-numbered years.

PLS 6655: Plant/Herbicide Interaction (3) *Prereq: PLS 4601 and BOT 3503.* Herbicide activity on plants: edaphic and environmental influences, absorption and translocation, response of specific physiological and biochemical processes as related to herbicide mode of action. Offered spring term in odd-numbered years.

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Anatomy and Cell Biology

College of Medicine

Graduate Faculty

Chair: S. A. Sugrue. *Graduate Coordinator:* D. Liao.
Complete faculty listing by department: Follow this link

The Graduate Faculty of the Department of Anatomy and Cell Biology participates in the interdisciplinary program (IDP) in medical sciences, leading to the Doctor of Philosophy degree, with specialization in one of the six advanced concentration areas of the IDP (see Medical Sciences). Departmental areas of research associated with the IDP focus on topical problems in cell biology, developmental biology, and molecular biology. Laboratory research is supported by funding from the National Institutes of Health, the National Science Foundation, state agencies, and private foundations. The Department is committed to providing an excellent intellectual environment for students who wish to pursue graduate studies. In addition to courses associated with the IDP, the Department of Anatomy and Cell Biology offers the courses listed below.

GMS 6061: Nuclear Structure and Dynamics (1) *Prereq: GMS 6001 or consent of instructor.* Cell biology of the nucleus. Offered in odd-numbered years.
GMS 6062: Protein Trafficking (1) *Prereq: GMS 6001 or consent of instructor.* Movement of proteins in cell. Offered in even-numbered years.
GMS 6063: Mechanisms of Aging (1) *Prereq: GMS 6001 or consent of instructor.* Recent developments in the field of aging.
GMS 6064: Tumor Biology (1) *Prereq: GMS 6001 or consent of*

instructor. Current understanding of the molecular basis of cancer. Offered in odd-numbered years.

GMS 6421: Cell Biology (4) *Prereq: undergraduate biochemistry or cell biology or consent of instructor. Taught in conjunction with 1st year IDP core course.* Fundamental mechanisms of cell functions, specializations, and interactions that account for the organization and activities of basic tissues.

GMS 6607C: Musculoskeletal Systems (4) *Prereq: consent of instructor, recommendation of graduate adviser, good standing in approved master's or doctoral program.* Human dissection and application of anatomical principles underlying clinical sciences including systemic approach to radiographic interpretation. Offered summer term B.

GMS 6609: Advanced Gross Anatomy (2-4; max: 6) Regional and specialized anatomy of the human body taught by laboratory dissection, conferences, and demonstrations.

GMS 6635: Organization of Cells and Tissues (2) *Prereq: GMS 6001 or consent of instructor.* Structural and functional aspects.

GMS 6642: Morphogenesis: Organ Systems I (2) *Prereq: GMS 6635, second-year IDP student.* Skin, respiratory, lymphatics, and special sense.

GMS 6643: Morphogenesis: Organ Systems II (2) *Prereq: GMS 6642, second-year IDP student.* GI, kidney, endocrine, male and female reproduction.

GMS 6644: Apoptosis (1) *Prereq: GMS 6001 or consent of instructor.* Modern view of the molecular mechanisms of tumor development. Offered in even-numbered years.

GMS 6690: Molecular Cell Biology Journal Club (1; max: 12) Faculty-student discussion of research papers and topics.

GMS 6691: Special Topics in Cell Biology and Anatomy (1-4; max: 10) Readings in recent research literature of anatomy and/or applied disciplines including cell, developmental, and reproductive biology.

GMS 6692: Research Conference in Anatomy and Cell Biology (1; max: 12) Research reports and discussions of current research by graduate students, faculty, and invited speakers.

GMS 6970: Individual Study (1-3; max: 8) Supervised study in areas not covered by other graduate courses.

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Animal Molecular and Cellular Biology

Colleges of Agricultural and Life Sciences, Liberal Arts and Sciences, Medicine, and Veterinary Medicine

Director: L. Badinga. *Co-Director:* A. D. Ealy.
Complete faculty listing by department: Follow this link

The animal molecular and cell biology (AMCB) graduate program offers Master of Science and Doctor of Philosophy degrees. Faculty are drawn from these disciplines:

--Animal Sciences
--Biochemistry and Molecular Biology
--Large Animal Clinical Sciences
--Obstetrics and Gynecolog
--Zoology

Early in the program, students choose a faculty supervisor who will ensure the quality of their research experience. Students may also do optional rotations through the laboratories of one or more other faculty. The Annual Research Symposium features guest speakers and student research presentations. A weekly journal club and monthly seminars draw on the knowledge and diversity the campus offers in molecular and cell biology.

Core course requirements for the M.S. degree are BCH 5045 and registration in a 1-credit graduate seminar course. Core course requirements for the Ph.D. include BCH 5413 and GMS 6421 and registration in two graduate seminar courses. The following courses count as graduate major credit:

--ASG 6666L: Molecular and Cell Research Methods
--ANS 5446: Animal Nutrition
--ANS 6310: Experimental Embryology
--ANS 6313: Current Concepts in Reproductive Biology
--ANS 6704: Endocrinology
--ANS 6706: Environmental Physiology of Domestic Animals
--ANS 6718: Nutritional Physiology of Domestic Animals
--ANS 6751: Physiology of Reproduction
--BCH 6740: Physical and Structural Biochemistry
--BME 5401: Biomedical Engineering and Physiology I
--GMS 6013: Developmental Genetics
--GMS 6014: Applications of Bioinformatics to Genetics
--GMS 6031: Molecular Immunology
--GMS 6051: Signal Transduction
--GMS 6061: Nuclear Structure and Dynamics
--GMS 6062: Protein Trafficking
--GMS 6065: Fundamentals of Cancer Biology
--GMS 6140: Principals of Immunology
--GMS 6331: Stem Cell Biology
--GMS 6647: Transcriptional and Translational Control of Cell Growth and Proliferation
--MCB 6485: Advanced Techniques in Microbiology and Cell Science

--PCB 5065: Advanced Genetics
--PCB 5235: Immunology
--PCB 5615: Molecular Evolution and Systematics
--PCB 6176: Electron Microscopy of Biological Materials
--PHA 6449: Pharmacogenomics
--STA 6168: Statistical Genomics and Genetics
--STA 6934: Special Topics in Statistics: Techniques in Microarray Data Analysis
--VME 5244: Physiology: Organ Systems
--VME 6602: General Toxicology
--ZOO 6927: Special Topics: Evolutionary Genetics

Contact Lokenga Badinga at lbadinga@ufl.edu or visit the program's website at http://www.animal.ufl.edu/amcb/.

ANS 5446: Animal Nutrition (3) *Prereq: ANS 3440, BCH 4024, or consent of instructor.* Carbohydrates, fats, proteins, minerals, and vitamins and their functions in the animal body. Offered fall term.
ANS 6310: Experimental Embryology (4) *Prereq: ANS 6751C, BCH 5045.* Fundamentals of embryology. Emphasizes mammals and current experimental approaches to embryo research.
ANS 6313: Current Concepts in Reproductive Biology (2) *Prereq: ANS 3319C or equivalent; consent of instructor.* Lectures prepared by students and discussion of current review articles. Offered fall term in odd-numbered years.
ANS 6704: Mammalian Endocrinology (3) *Prereq: BCH 4024 or BCH 3025.* Fundamental concepts of how various hormones regulate

homeostasis, development, growth, metabolism, and reproduction in mammals from a physiologic and cell biology perspective.

ANS 6706: Environmental Physiology of Domestic Animals (3)

ANS 6718: Nutritional Physiology of Domestic Animals (3) *Prereq: ANS 5446; introductory biochemistry course.* Integration of endocrine, biochemical, and molecular control of nutritional processes in domestic animals. Offered fall term.

ANS 6751: Physiology of Reproduction (3) *Prereq: BCH5045 or equivalent.* Conceptual relationship of the hypothalamus, pituitary, and reproductive organs during the estrous cycle and pregnancy. Influence of exteroceptive factors and seasonal reproduction.

BCH 6740: Physical Biochemistry/Structural Biology (3) *Prereq: BCH 4024, CHM 4207, or consent of instructor. Course in physical chemistry recommended. One of three core biochemistry courses.* Physical chemistry of biological molecules and techniques to study their properties. Approaches to structure determination.

BME 5401: Biomedical Engineering and Physiology I (3) Physiology of cells, bones, and the circulatory system from a biomaterials, biomechanics, cellular, and tissue engineering perspective. Intellectual property and technology transfer included.

GMS 6013: Developmental Genetics (1; max: 3) *Prereq: GMS 6001 or consent of instructor.* Theoretical framework for understanding the fundamentals of developmental genetics. Advantages and limitations of several model systems and their application to the study of development.

GMS 6014: Applications of Bioinformatics to Genetics (1) *Prereq: GMS 6001; consent of instructor.* Storage, retrieval, and analysis of information related to genetics.

GMS 6017: In-Vitro Fertilization Laboratory Practicum A (4) *Prereq: master's degree in animal sciences. Coreq: acceptance into the Animal Molecular and Cellular Biology (AMCB) graduate program.* IVF training and lectures leading to proficiency in human-assisted reproductive technologies. Hands-on manipulation of human gametes in preparation for patient clinical management during infertility treatment. S/U.

GMS 6018L: Advanced in-Vitro Fertilization Laboratory Practicum (4) *Prereq: GMS 6017 and master's degree in animal science. Coreq: acceptance into Animal Molecular and Cellular Biology (AMCB) graduate program.* Advanced IVF training leading to proficiency in human-assisted reproductive technologies. Hands-on manipulation of human gametes in preparation for patient clinical management during infertility treatment. S/U.

GMS 6031: Molecular Immunology (1) *Prereq: GMS 6001, 6006, or consent of instructor.* Biological and biochemical aspects, focusing on molecular events critical to development of an immune response.

GMS 6051: Signal Transduction (1) *Prereq: GMS 6001 or consent of instructor.* Focuses on the mechanisms underlying cellular signal transduction.

GMS 6061: Nuclear Structure and Dynamics (1) *Prereq: GMS 6001 or consent of instructor.* Cell biology of the nucleus. Offered in odd-numbered years.

GMS 6062: Protein Trafficking (1) *Prereq: GMS 6001 or consent of instructor.* Movement of proteins in cell. Offered in even-numbered years.

GMS 6065: Fundamentals of Cancer Biology (2) *Prereq: GMS 6001 or consent of instructor.* Broad-based introduction into causes of cancer, molecular and biological processes involved in malignancies, and current cancer treatment approaches.

GMS 6140: Principles of Immunology (3) *Prereq: GMS 6001 or consent of instructor.* Biological and biochemical aspects of host resistance and immunity. Chemical and physiochemical properties of the proteins of immune reactions.

GMS 6331: Stem Cell Biology(1) *Prereq: GMS 6001 or consent of instructor.* Recent progress in mammalian stem cell research.

GMS 6647: Transcriptional and Translational Control of Cell Growth and Proliferation (1) *Prereq: GMS 6001 or consent of instructor.* The role of transcription and translation in controlling gene expression regulating cell growth and proliferation.

MCB 6485: Advanced Techniques in Microbiology and Cell Science (2-4; max: 4) *Prereq: consent of instructor.* Application of advanced techniques to experimental research in biochemistry, cell biology, and microbiology.

PCB 5065: Advanced Genetics(4) *Prereq: AGR 3303 or PCB 3063 and BCH 4024 or 5045. For graduate students in any life science discipline.* Examines genetic principles including gene and gene function; recombination and linkage; molecular markers, multipoint linkage analysis, and positional cloning; and quantitative, population, developmental, and non-Medalian genetics. Offered in fall term.

PCB 5235: Immunology (3) *Prereq: C grade or higher in MCB 3020L.* Immune system of vertebrate animals. The cellular and molecular events involved in immune responsiveness and resistance to infectious diseases.

PCB 5615: Molecular Evolution and Systematics (4) *Prereq: PCB 3063, graduate standing, or consent of instructor.* Patterns and processes of change at the molecular level in populations, species, and higher taxonomic groups, and their systematic implications.

PCB 6176: Electron Microscopy of Biological Materials (2) *Prereq: MCB 3020 or equivalent.* Use of the electron microscope, including fixation, embedding, sectioning, freeze-etching, negative staining, and use of vacuum evaporator.

STA 6934: Special Topics in Statistics (1-3; max: 12) *Prereq: permission of graduate adviser.*

VME 5244: Physiology: Organ Systems (4) *Prereq: knowledge of general biochemistry.* Emphasizes domestic animals commonly encountered in veterinary medicine. Physiology of nervous, muscle, blood, cardiovascular, respiratory, renal, gastrointestinal, and endocrine systems.

VME 6602: General Toxicology (3) *Prereq: background in biochemistry, physiology, and pharmacology.* General principles of toxicology. Mechanisms for occurrence of toxic effects in target organs and tissues.

ZOO 6927: Special Topics in Zoology (1-4; max: 15)

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Animal Sciences

College of Agricultural and Life Sciences

Graduate Faculty

Chair: G. E. Dahl. *Graduate Coordinator:* J. H. Brendemuhl.
Complete faculty listing by department: Follow this link

The Department of Animal Sciences offers the degrees of Master of Science and Doctor of Philosophy in animal sciences with emphasis in beef or dairy cattle or equine. Requirements for these degrees are given in the General Information section of this catalog.

The following specializations are available:

--Breeding and genetics
--Management
--Nutrition (nutritional physiology, nutrient metabolism, and feedstuff utilization)
--Physiology (environmental, lactational, and reproductive)
--Molecular biology (embryology, endocrinology, and genetics)
--Meat science (meat processing, meat quality, muscle biology, and food safety)

A student may work on a problem covering more than one area of study. Animal resources (beef cattle, dairy cattle, horses, swine, sheep, and laboratory animals) are available for use in various research programs. Nutrition, physiology, and meats laboratories are available for detailed chemical and carcass quality evaluations, and excellent computer facilities are available. Special arrangements may be made to conduct research at the various branch agricultural experiment stations throughout Florida.

Departmental and program prerequisites for admission to graduate study include a sound science background, with basic courses in microbiology, biology, mathematics, and chemistry. All courses in the animal sciences program area are acceptable for graduate credit as part of the candidate's major. In addition, the following courses also fulfill this requirement (Note: These courses are automatically counted as major credit by the Graduate School; therefore, they cannot be used to fulfill any other degree requirement):

--AEB 5326: Agribusiness Financial Management
--AEB 6182: Agricultural Risk Analysis and Decision Making
--AEB 6385: Management Strategies for Agribusiness Firms
--FOS 5205: Current Issues in Food Safety and Sanitation
--FOS 5225C: Principles in Food Microbiology
--FOS 5437C: Food Product Development
--FOS 5732: Current Issues in Food Regulations
--FOS 6126C: Psychophysical Aspect of Foods
--FOS 6226C: Advanced Food Microbiology
--FOS 6315C: Advanced Food Chemistry
--FOS 6317C: Flavor Chemistry and Technology
--FOS 6355C: Instrumental Analysis and Separations
--FOS 6428C: Advanced Food Processing
--FOS 6455C: Industrial Food Fermentations
--FOS 6646: Proteins and Enzymes in Food Systems
--FOS 6648: Carbohydrates in Food Systems
--HUN 5447: Nutrition and Immunity
--HUN 6245: Advanced Human Nutrition; VME 5162C Avian Diseases
--HUN 6301: Nutritional Aspects of Lipid Metabolism
--HUN 6305: Nutritional Aspects of Carbohydrates
--HUN 6321: Proteins and Amino Acids in Nutrition
--VME 5244: Physiology of Mammals: Organ Systems

The Graduate School restricts graduate students from pursuing minors in academic units that contribute major credit towards their degree program. Therefore, graduate students majoring in Animal Sciences cannot pursue a minor in Food and Resource Economics, Food Science and Human Nutrition, Medicine-Biochemistry, and Veterinary Medical Sciences. In addition, undergraduate credits at the 3000–4000 level in the major of any of these listed academic units are not eligible to count towards degree requirements.

The Department offers a combined bachelor's/master's program. Contact the graduate coordinator for information.

ANS 5312C: Applied Ruminant Reproductive Management (3) *Prereq: ANS 3319C* In-depth review of applied bovine reproductive management; factors that affect the efficiency of reproduction (managerial, biological, and economical).
ANS 5446: Animal Nutrition (3) *Prereq: ANS 3440, BCH 4024, or*

consent of instructor. Carbohydrates, fats, proteins, minerals, and vitamins and their functions in the animal body. Offered fall term.

ANS 5935: Reproductive Biology Seminar and Research Studies (1; max: 4) *Prereq: ANS 3319C or equivalent.* Invited speakers on a wide range of topics. Student-faculty participation in research projects. S/U.

ANS 6281: Dairy Science Research Techniques (3) *Prereq: STA 6167.* Methods used in research in specialized dairy fields; genetics, nutrition, and physiology.

ANS 6288: Experimental Techniques and Analytical Procedures in Meat Research (3) Experimental design, analytical procedures; techniques; carcass measurements and analyses as related to livestock production and meats studies. Offered spring term in even-numbered years.

ANS 6310: Experimental Embryology (4) *Prereq: ANS 6751C, BCH 5045.* Fundamentals of embryology. Emphasizes mammals and current experimental approaches to embryo research.

ANS 6313: Current Concepts in Reproductive Biology (2) *Prereq: ANS 3319C or equivalent; consent of instructor.* Lectures prepared by students and discussion of current review articles. Offered fall term in odd-numbered years.

ANS 6449: Vitamins (3) *Prereq: organic chemistry.* Historical development, properties, assays, and physiological effects.

ANS 6452: Principles of Forage Quality Evaluation (3) *Prereq: ANS 5446, AGR 4231C.* Definition of forage quality in terms of animal performance, methodology used in forage evaluation, and proper interpretation of forage evaluation data. Offered spring term in even-numbered years.

ANS 6458: Advanced Methods in Nutrition Technology (3) *Prereq: for graduate students but open to seniors by special permission.* Demonstrations and limited performance of procedures used in nutrition research. Offered fall term in even-numbered years.

ANS 6636: Meat Technology (3) Chemistry, physics, histology, bacteriology, and engineering involved in the handling, processing, manufacturing, preservation, storage, distribution, and utilization of meat. Offered fall term in odd-numbered years.

ANS 6666L: Molecular and Cellular Research Methods (2) *Prereq: enrollment in AMCB concentration.* Diversity of research topics and laboratory techniques demonstrated. Short laboratory rotations (3 to 6 weeks) with 3 scientists.

ANS 6702C: Advanced Physiology of Lactation (2)

ANS 6704: Mammalian Endocrinology (3) *Prereq: BCH 4024 or BCH 3025.* Fundamental concepts of how various hormones regulate homeostasis, development, growth, metabolism, and reproduction in mammals from a physiologic and cell biology perspective.

ANS 6706: Environmental Physiology of Domestic Animals (3)

ANS 6711: Current Topics in Equine Nutrition and Exercise Physiology (2) Equine science with emphasis on current topics of interest. Offered fall term in odd-numbered years.

ANS 6715: The Rumen and Its Microbes(3) *Prereq: ANS 5446.*

Review and correlation of fundamental biochemical, physiological, and bacteriological research upon which feeding of ruminants is based. Experimental methodology of rumen physiology and metabolism.

ANS 6717: Energy Metabolism (3) *Prereq: ANS 5446; BCH 4024, 3025; or consent of instructor.*

ANS 6718: Nutritional Physiology of Domestic Animals (3) *Prereq: ANS 5446; introductory biochemistry course.* Integration of endocrine, biochemical, and molecular control of nutritional processes in domestic animals. Offered fall term.

ANS 6723: Mineral Nutrition and Metabolism (3) Physiological effect of macro- and micro-elements, and mineral interrelationships.

ANS 6745: Introduction to Statistical Genetics (2) *Prereq: PCB 6555, STA 6167.* Development and application of statistical and quantitative genetics theory to selection and estimation of genetic parameters.

ANS 6751: Physiology of Reproduction (3) *Prereq: BCH5045 or equivalent.* Conceptual relationship of the hypothalamus, pituitary, and reproductive organs during the estrous cycle and pregnancy. Influence of exteroceptive factors and seasonal reproduction.

ANS 6767: Molecular Endocrinology (3) *Prereq: BCH 4024 or equivalent, or consent of instructor.* Molecular basis of hormone action and regulation, and emerging techniques in endocrine system study; emphasis on molecular mechanisms of growth, development, and reproduction.

ANS 6905: Problems in Animal Science (1-4; max: 8) H.

ANS 6910: Supervised Research (1-5; max: 5) S/U.

ANS 6932: Special Topics in Animal Science (1-3; max: 9) New developments in animal nutrition and livestock feeding, animal genetics, animal physiology, and livestock management.

ANS 6933: Graduate Seminar in Animal Science (1; max: 8)

ANS 6936: Graduate Seminar in Animal Molecular and Cell Biology (1; max: 2) Seminar attendance and 1-hour presentation on graduate research project.

ANS 6939: Animal Molecular and Cellular Biology Journal Colloquy (1; max: 5) Critical evaluation, presentation and discussion of recent scientific journal articles on a specified topic in cellular and/or molecular biology. S/U.

ANS 6940: Supervised Teaching (1-5; max: 5) S/U.

ANS 6971: Research for Master's Thesis (1-15) S/U.

ANS 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

ANS 7980: Research for Doctoral Dissertation (1-15) S/U.

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Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Anthropology

College of Liberal Arts and Sciences

Graduate Faculty

Chair: K. E. Sassaman, Jr. *Graduate Coordinator:* B. Chalfin.
Complete faculty listing by department: Follow this link

The department of Anthropology offers graduate work leading to the Master of Arts (thesis or nonthesis option) and Doctor of Philosophy degrees. Requirements for these degrees are given in the *General Information* section of this catalog. For more information, visit the departmental website: http://web.anthro.ufl.edu. Graduate training is offered in cultural anthropology, archeology, and biological anthropology.

Students may opt for a general four-field track and an interdisciplinary track. The general track allows students more exposure to the four subfields of anthropology, as well as a specialization within anthropology at the Ph.D. level. The interdisciplinary alternative allows students to combine anthropology with course work and training in some outside discipline.

The department generally requires applicants to have acceptable scores on the GRE (verbal, quantitative, and analytical portions) and a 3.2 overall grade point average based on a 4.0 system. Previous work in anthropology is an asset but not a strict requirement for admission. Potential applicants are urged to visit the website to familiarize themselves with the specializations of our faculty and to indicate in their application those faculty with whom they might work. Barring special circumstances, the Department restricts admission to applicants interested in earning a

Ph.D. Students who enter without an M.A. will generally work for their M.A. on the way to the Ph.D. This requires either a formally-defended thesis or written qualifying exams combined with a high-quality paper or research report. With their adviser's permission, they may opt to bypass the M.A. Knowledge of a foreign language or of statistics may also be required by the student's supervisory committee.

Students enrolled in the M.A. program who wish to continue their studies for a Ph.D. must apply to the Department for certification. In most cases, candidates for the Ph.D. must achieve competency in a language other than English. Entering students who have earned a master's degree may apply for direct admission to the doctoral program.

New students are admitted into the graduate program only in the fall of each academic year. The deadline for receiving completed applications for admission into the graduate program is December 15, though the department encourages early applications.

ANG 5126: Zooarcheology (3) *Prereq: consent of instructor.* Human use of animal resources, emphasizing prehistoric hunting and fishing practices. Origins of animal domestication.
ANG 5158: Florida Archeology (3) Survey of 12,000 years of human occupation of Florida, including early hunters and foragers, regional cultural developments, external relationships with the Southeast and Caribbean regions, peoples of historic period, and effects of European conquest. Not open to students who have taken ANT 3157.
ANG 5162: Maya Archeoastronomy and Ethnoastronomy(3) Focus on Maya cosmology, past and present with emphasis on continuity of culture seen in specific astronomical concepts.
ANG 5164: The Inca and Their Ancestors (3) Evolution of the Inca empire traced archeologically through earlier Andean states and societies to the beginning of native civilization. Not open to students who have taken ANT 3164.
ANG 5172: Historical Archeology (3) *Prereq: ANT 3141 or consent of instructor.* Methods and theoretical foundations of historical archeology as it relates to the disciplines of anthropology, history, historic preservation, and conservation. Introduction to pertinent aspects of material culture during the historic period.
ANG 5194: Principles of Archeology (3) *Prereq: 1 course in anthropology.* Methods of archeological inquiry and interpretation, which include site identification and evaluation, dating techniques, environmental reconstructions, subsistence, technology, social and exchange systems, biological remains, and archeological ethics. Not open to students who have taken ANT 4185.
ANG 5242: Fantastic Anthropology and Fringe Science(3) Examination of paranormal and pseudoscientific theories concerning human condition. Critical examination of fringe science claims and their perpetuation in contemporary society.

ANG 5255: Rural Peoples in the Modern World (3) Historical background and comparative contemporary study of peasant and other rural societies. Unique characteristics, institutions, and problems of rural life stressing agriculture and rural-urban relationships in cross-cultural perspective. Not open to students who have taken ANT 4255.

ANG 5266: Economic Anthropology (3) Anthropological perspectives on economic philosophies and their behavioral bases. Studies of production, distribution, and consumption; money, savings, credit, peasant markets; and development in a cross-cultural context from perspectives of cultural ecology, Marxism, formalism, and substantivism. Not open to students who have taken ANT 4266.

ANG 5303: Women and Development (3) Influence of development on women in rural and urban areas. Women's participation in the new opportunities of modernization.

ANG 5310: The North American Indian (3) The peopling of North America. The culture areas of North America. Unique characteristics, institutions, and problems. Not open to students who have taken ANT 4312.

ANG 5323: Peoples of Mexico and Central America (3) Settlement and early cultures of the area, emphasizing the rise of the major culture centers. Impact of European civilization on surviving Indians. Not open to students who have taken ANT 4326.

ANG 5327: Maya and Aztec Civilizations (3) Civilizations in Mesoamerica from the beginnings of agriculture to the time of the coming of Europeans. Maya and Aztec civilizations as well as the Olmec, Zapotec, and Teotihuacan cultures. Not open to students who have taken ANT 3325.

ANG 5330: The Tribal Peoples of Lowland South America (3) Survey of marginal and tropical forest hunters and gatherers and horticulturalists of the Amazon Basin, Central Brazil, Paraguay, Argentina, and other areas of South America. Social organization, subsistence activities, ecological adaptations, and other aspects of tribal life. Not open to students who have taken ANT 4338.

ANG 5331: Peoples of the Andes (3) The area-cotradition. The Spanish Conquest and shaping and persistence of colonial culture. Twentieth-century communities–their social land tenure, religious, and value systems. Modernization, cultural pluralism, and problems of integration. Not open to students who have taken ANT 4337.

ANG 5336: The Peoples of Brazil (3) Ethnology of Brazil. Historical, geographic, and socioeconomic materials and representative monographs from the various regions of Brazil as well as the contribution of the Indian, Portuguese, and African to modern Brazilian culture. Not open to students who have taken ANT 4336.

ANG 5340: Anthropology of the Caribbean (3) Transformation of area through slavery, colonialism, and independence movements. Contemporary political, economic, familial, folk-religious, and folk-healing systems. Migration strategies and future options. Not open to students who have taken ANT 4346.

ANG 5352: Peoples of Africa (3) Survey of the culture, history, and ethnographic background of the peoples of Africa. A basis for appreciation of current problems of acculturation, nationalism, and cultural survival and change among African peoples. Not open to students who have taken ANT 4352.

ANG 5354: Anthropology of Modern Africa (3) Continuity and change in contemporary African societies, with special reference to cultural and ethnic factors in modern nations. Not open to students who have taken ANT 4354.

ANG 5395: Visual Anthropology (3) *Prereq: basic knowledge of photography, or consent of instructor.* Photography and film as tools and products of social science. Ways of describing, analyzing, and presenting behavior and cultural ideas through visual means, student projects, and laboratory work with visual anthropology. Not open to students who have taken ANT 3390.

ANG 5426: Kinship and Social Organization (3) *Prereq: ANT 2402 or 2410.* Property concepts, forms, and complexes. Tribal patterns of government and social control. Not open to students who have taken ANT 4426.

ANG 5464: Culture and Aging (3) *Prereq: two of following: ANT 2410, SYG 2000, or introductory psychology course.* Cross-cultural perspectives of adult development and aging in traditional and industrial society. Comparative assessment of culturally mediated, life-cycle transformations into old age and health related and human service policy issues. Not open to students who have taken ANT 4464.

ANG 5467: Culture and Nutrition (3) *Prereq: HUN 3221.* Theory, methodology, and substantive material of nutritional anthropology. Emphasizes cross-cultural bio-behavioral patterns.

ANG 5485: Research Design in Anthropology (3) Examination of empirical and logical basis of anthropological inquiry. Analysis of theory construction. Research design. Problems of data collection, processing, and evaluation.

ANG 5486: Computing for Anthropologists (3) *Prereq: ANG 5485 or consent of instructor.* Practical introduction to the computer. Collecting, organizing, processing, and interpreting numerical data on a microcomputer. Data sets used correspond to participants' subfields.

ANG 5522: Human Rights Missions in Forensic Anthropology(3) Preparation for fieldwork in forensic investigation of human rights abuses and war crimes. Topics include review of current targeted ethnic conflicts, logistics of fieldwork, consulting with human rights groups, and scientific procedure.

ANG 5523: International Forensic Fieldwork in Human Rights(3-6) Fieldwork in forensic investigation of human rights abuses, ethnic cleansing, and war crimes. Excavation of mass gravesites, lab work in human identification and trauma analysis, and logistical support for team members.

ANG 5525: Human Osteology and Osteometry (3) *Prereq: ANT 3514 and consent of instructor.* Human skeletal identification for the physical anthropologist and archeologist. Techniques for estimating

age at death, race, and sex from human skeletal remains. Measurement of human skeleton for comparative purposes. Not open to students who have taken ANT 4525.

ANG 5546: Seminar: Human Biology and Behavior(3) *Prereq: consent of instructor.* Social behavior among animals from the ethological-biological viewpoint; the evolution of animal societies; the relevance of the ethological approach for the study of human development.

ANG 5620: Language and Culture (3) Principles and problems of anthropological linguistics. The cross-cultural and comparative study of language. Primarily concerned with the study of non-Indo-European linguistic problems.

ANG 5621: Proseminar in Cultural and Linguistic Anthropology(3) History and theory of subfields of cultural and linguistic anthropology and their conceptual relationship to each other. Emphasis on current issues and their historical foundations.

ANG 5700: Applied Anthropology (3) Survey of history, theory and practice of applying cultural anthropology to human issues and problems. Applications to international development, peace studies, health, education, agriculture, ethnic minority and human rights issues. Case review, including aspects of planning, consultancy work, evaluation research, and ethics.

ANG 5701: Seminar on Applied Anthropology (3) *Prereq: ANG 5700 or consent of instructor.* Consideration of planned socio-cultural and technological change and development in the United States and abroad; special and cultural problems in the transferral of technologies; community development and aid programs. Comparative program evaluation.

ANG 5702: Anthropology and Development (3) Examination of theories and development and their relevance to the Third World, particularly Africa or Latin America. After this microanalysis, microlevel development will be examined with special reference to rural areas.

ANG 5711: Culture and International Business(3) Anthropological and business concepts and literature in local and global economies. Value, wealth, communication, business practices, marketing, advertising, corporate organization, entrepreneurship, multinationals, etc.

ANG 5824L: Field Sessions in Archeology (6) *Prereq: 6 hours of anthropology, or consent of instructor.* Excavating archeological sites, recording data, laboratory handling and analysis of specimens, and studying theoretical principles that underlie field methods and artifact analysis. Not open to students who have taken ANT 4124 or equivalent.

ANG 6005: Southeastern U.S. Prehistory (3) Prehistory of the southeastern United States, emphasizing problem-oriented research of broad anthropological significance.

ANG 6034: Seminar in Anthropological History and Theory (3) Theoretical principles and background of anthropology and its subfields.

ANG 6086: Historical Ecology (3) Relationship between human

social and physical environments over long time spans. Theoretical and methodological relationships of cultural ecology to biology, geographical, and historical issues.

ANG 6088: Race and Racism in Anthropological Theory (3) Critical anthropological approaches to race. Historically contingent material and ideological contexts in which various peoples become racialized in culturally diverse ways.

ANG 6091: Research Strategies in Anthropology (3) *Prereq: consent of instructor.* Survey of techniques for preparing research proposals and strategies for securing extramural funding for thesis. Review of scientific epistemology, hypothesis specification, and ethics. Proposal and curriculum vitae preparation.

ANG 6110: Archaeological Theory(3) *Prereq: Proseminar in archaeology or consent of instructor; not open to students who have taken ANG 5110.* Theoretical approaches in social sciences and philosophies, developed and applied in anthropological archaeology through the 20th century and into the 21st. Relationship of archaeology to anthropology.

ANG 6110: Archeological Theory (3) *Prereq: one course in archeology or anthropology, or consent of instructor.* Survey of the theoretical and methodological tenets of anthropological archeology; critical review of archeological theories, past and present; relation of archeology to anthropology. Not open to students who have taken ANT 4110.

ANG 6112: Critical Archaeology of Time (3) Case-based approach to problems at the intersection of measured time in archaeology, and the practice and reckoning of time, in mostly non-Western societies.

ANG 6113: Ideology and Symbolic Approaches in Archaeology (3) Critical examination of the development of thought in archaeology extending beyond a materialist interpretation of culture. Explores causality and the role of mind and culture as mediators between the environment and political, economic, and social structures.

ANG 6115: Problems in Caribbean Prehistory (3) Theories and methods for study of prehistoric human societies. Case studies drawn primarily from Caribbean islands.

ANG 6120C: Environmental Archaeology(3) Theory and case studies integrating zooarchaeology, archaeobotany, and geoarchaeology to interpret past human interactions with the natural environment.

ANG 6121: Archaeology of Maritime Adaptations(3) Archaeological and ethnographic cross-cultural examination of the nature of coastal adaptations.

ANG 6122: Archaeological Ceramics(3) Technofunctional analysis and interpretation of archaeological ceramics. Emphasizes the life cycle of pottery.

ANG 6128: Lithic Technology (3) Flintworking techniques and uses of stone implements for two million years. Emphasis on stoneworking technology in prehistoric Florida.

ANG 6160: Problems in South American Archaeology (3-6;

max: 9) Problems and issues raised by new research on cultural evolution in South America. Topics vary significantly by professor, and students may take one or all of the topics in any sequence.

ANG 6180: Seminar in Contemporary Methods(3; max: 9) Collecting and analyzing research data. Focus on one method or set of methods in any semester.

ANG 6185: Ethnoarchaeology (3) Case studies examining theoretical and methodological approaches to ethnoarchaeology, with applications to field exercises.

ANG 6186: Seminar in Archeology (3; max: 10) Selected topic.

ANG 6187: Experimental Archaeology (3) Principles and applications of experimental archaeology. Draws on a broad range of case studies to show the numerous experimental methods archaeologists have used to solve analytic or interpretive problems.

ANG 6224: Painted Books of Ancient Mexico: Codices of Aztecs, Mixtecs, and Mayas(3) Colonial period and Precolumbian Codices of Mexico, with emphasis on painted books recording history and calendars of Mixtecs, Aztecs, and Mayas.

ANG 6261: Anthropology, Geographic Information System, and Human Ecosystems(3) Sociocultural processes and interactions in large scale spatial/ecosystems context.

ANG 6273: Legal Anthropology (3) *Prereq: graduate standing.* Interrelationships between aspects of traditional and modern legal systems and sociocultural, economic, and political forces that impinge upon them. Methods of analysis, legal reasoning crossculturally, pre-industrial and modern sociolegal systems.

ANG 6274: Principles of Political Anthropology (3) Problems of identifying political behavior. Natural leadership in tribal societies. Acephalous societies and republican structures. Kingship and early despotic states. Theories of bureaucracy. Not open to students who have taken ANT 4274.

ANG 6286: Seminar in Contemporary Theory (3; max: 10) Areas treated are North America, Central America, South America, Africa, Oceania.

ANG 6292: Special Topics in Ecology of Religion (3; max: 6) Cross-cultural examination of development of religious practices and their relationship to the environment.

ANG 6303: Seminar in Gender and International Development(3) *Prereq: ANG 5303 recommended.* Analyses of academic and development concepts and projects in relation to gender. Multi-, bilateral, and NGO agencies considered by sector (health, agriculture, environment, education, political empowerment, etc.). RRA, PRA, GAF methods.

ANG 6314: Peoples of the Arctic(3) Survey of the culture, history, and ethnographic background of circumpolar Arctic. Examines problems of acculturation, human ecology, cultural survival, and self-determination of northern indigenous peoples.

ANG 6351: Peoples and Culture in Southern Africa (3) Prehistoric times through first contacts by explorers to settlers; the contact situation between European, Khoisan, and Bantu-speaking; empirical data dealing with present political, economic, social, and

religious conditions.

ANG 6360: Ethnicity in China(3) Ethnic diversity and ethnic relations in China. Multi-ethnic history of China; theories on nationality and ethnicity; state and ethnicity; ethnic conflict and political economy; gender and ethnic hierarchy.

ANG 6366: Family, Gender, and Population in China (3) Examines the processes by which the family system, gender relations, and population interact to become powerful forces in shaping contemporary China's political, social, and economic conditions.

ANG 6421: Landscape, Place, Dwelling (3) Contemporary theoretical approaches and applications to the social construction of place and space from the macro-scale of landscape to the micro-scale of dwelling. Emphasis on materiality of experience of inhabiting space.

ANG 6434L: Anthropology of Science (3) Production of scientific knowledge, expertise, and authority through ethnographies of scientific practice. Major schools of thought from social studies to scientific knowledge to the Bath School to Actor-Network Theory, and beyond.

ANG 6453: Human Rights in Cross-Cultural Perspective (3) Anthropological perspectives on the discourses and practices of international human rights.

ANG 6460L: Advanced Molecular Anthropology Laboratory(1-3; max: 6) *Prereq: consent of instructor.* Research design, experimentation, discussion, and presentation of findings of individual laboratory-based projects.

ANG 6461: Seminar in Molecular Anthropology(3) *Prereq: consent of instructor.* Current applications of molecular data to questions of human evolution and genetics, based on most recent journal articles. Possible topics: emergence of modern Homo sapiens and population movements.

ANG 6462L: Biological Anthropology Laboratory(4) *Prereq: consent of instructor.* Hands-on experience with latest molecular and stable isotope techniques as applied to questions of anthropologic interest.

ANG 6469: Molecular Genetics of Disease (3) Examines the molecular genetics of human disease. Discusses a range of diseases from single-gene recessive defects (such as cystic fibrosis) to complex diseases (such as alcoholism and diabetes). Also discusses detection and treatment.

ANG 6478: Evolution of Culture (3) *Prereq: ANT 3141.* Theories of culture growth and evolution from cultural beginnings to dawn of history. Major inventions of man and their significance.

ANG 6511: Seminar in Physical Anthropology (3; max: 10) Selected topic.

ANG 6514: Human Origins(3) Review of fossil record of human evolution from Miocene to present. "Hands-on" seminar in basics of hominid fossil record.

ANG 6524: Skeletal Mechanics in Biological Anthropology (3) *Prereq: ANG 5525, and either ANG 5683 or ANG 6740.*

Mechanobiology of the primate skeleton. Material and structural basis for the functional behavior of bone. Analytical approaches to functional, allometric, and evolutionary adaptation.

ANG 6547: Human Adaptation (3) *Prereq: ANT 2511 or consent of instructor.* An examination of adaptive processes (cultural, physiological, genetic) in past and contemporary populations.

ANG 6552: Primate Behavior (3) *Prereq: one course in either physical anthropology or biology.* Taxonomy, distribution, and ecology of primates. Range of primate behavior for each major taxonomic group explored.

ANG 6553: Primate Cognition(3) Evolution of cognition in primate lineages. Behavioral, social, and phylogenetic influences on cognitive processes. Theories of learning and imitation and their impact on analysis of ecological and social decisions.

ANG 6555: Issues in Evolutionary Anthropology(3) Current controversies in biological anthropology. Role of evolutionary theory in addressing problems of taxonomy, speciation, systematics, selection, development, and adaptation in primate and human evolution.

ANG 6583: Primate Functional Morphology(3) Practical and theoretical approaches to functional morphology in living and fossil primates. Biomechanical techniques. Problems of functional inference in paleontological and archeological records.

ANG 6589: Behavioral Decisions Among Human and Nonhuman Primates(3) Survey and synthesis of literature of human and animal behavioral ecology to address theoretical problems in social and behavioral decision-making. Strategies for data collections and analysis.

ANG 6737: Medical Anthropology (3) *Prereq: consent of instructor.* Theory of anthropology as applied to nursing, medicine, hospital organization, and the therapeutic environment. Instrument design and techniques of material collection.

ANG 6740: Advanced Techniques in Forensic Anthropology(3) *Prereq: human osteology and forensic anthropology introduction.* Hands on analysis and clinical diagnoses of human skeletal remains. Analysis of human trauma and other demographic techniques.

ANG 6741: Archaeology of Death(3) Archaeological literature on mortuary data. History, cultural anthropology, and ethnography offer insights into the origin of religion, the nature of society, and the structure of ritual.

ANG 6750: Research Methods in Cognitive Anthropology(3) Data collection including free lists, pile sorts, triad tests, paired comparisons, rankings, and ratings. Consensus analysis, cluster analysis, and multidimensional scaling.

ANG 6801: Ethnographic Field Methods (3) Methods of collecting ethnographic data. Entry into the field; role and image conflict. Participant observation, interviewing, content analysis, photography and documents, data retrieval, analysis of data.

ANG 6823: Laboratory Training in Archeology (3) *Prereq: an introductory level archeology course.* Processing of data recovered in field excavations; cleaning, identification, cataloging, classification,

drawing, analysis, responsibilities of data reporting. Not open to students who have taken ANT 4123 or equivalent.

ANG 6905: Individual Work (1-3; max: 10) Guided readings on research in anthropology based on library, laboratory, or field work.

ANG 6910: Supervised Research (1-5; max: 5) S/U.

ANG 6915: Research Projects in Social, Cultural, and Applied Anthropology (1-3; max: 10) *Prereq: consent of instructor.* For students undertaking directed research in supplement to regular course work.

ANG 6917: Professions of Anthropology (3) *Prereq: required of all graduate students.* Organizations of the anthropological profession in teaching and research. Relationship between subfields and related disciplines; the anthropological experience; ethics.

ANG 6930: Special Topics in Anthropology (1-3; max: 9) *Prereq: consent of instructor.*

ANG 6940: Supervised Teaching (1-5; max: 5) S/U.

ANG 6945: Internship in Anthropology (1-8; max: 8) *Prereq: permission of graduate coordinator.* Required of all students registered in programs of applied anthropology. Students are expected to complete 4-8 hours.

ANG 6971: Research for Master's Thesis (1-15) S/U.

ANG 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

ANG 7980: Research for Doctoral Dissertation (1-15) S/U.

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Applied Physiology and Kinesiology

College of Health and Human Performance

Graduate Faculty

Chair: M. D. Delp. *Graduate Coordinator:* C. M. Janelle.
Complete faculty listing by department: Follow this link

The **Ph.D. program** is offered with concentrations in biobehavioral science and exercise physiology. Students in the biobehavioral science concentration specialize in one of four areas: biomechanics, exercise / performance psychology, motor control / learning, or sports medicine. These interdisciplinary concentrations focus on preparing students as researchers with a blend of course work and research training.

A program leading to the **Master of Science** degree in applied physiology and kinesiology (thesis and non-thesis options) is also offered. Areas of concentration for the master's program include athletic training/sports medicine, biobehavioral science, clinical exercise physiology, exercise physiology, and human performance. The thesis option gives the student an opportunity to study, conduct research, and prepare a thesis in an area of special interest. The non-thesis option offers the student a specialization in a selected area of study, with additional work in other areas. A comprehensive written examination is required for this option, as is a capstone internship experience. Requirements for these degrees are given in the *General Information* section of this catalog.

Athletic training/sports medicine: This concentration provides comprehensive academic preparation, research, and clinical experience in the areas of injury prevention, assessment, treatment,

rehabilitation, and therapeutic modalities.

Biobehavioral Science: This thesis mandatory concentration is multidisciplinary and flexible, permitting students to tailor their scholarly experience to the development of research skills in one of several related disciplines: biomechanics, motor control and learning, and exercise and performance psychology. Each area of specialization is briefly described below.

--*Biomechanics*: The specialization in biomechanics draws from the fields of neuroscience, engineering, and medicine. The course work and training include kinematics and kinetics of animal movement. Course work also includes anatomy/kinesiology, biomechanics, engineering, neuroscience, medicine, psychology, physical therapy, and statistics.

--*Motor learning / control*: This interdisciplinary specialization draws on experiences and a knowledge base in the movement and sport sciences, cognitive sciences, and physical therapy. Students are prepared to conduct research and provide expertise in traditional motor performance and learning settings.

--*Exercise / performance psychology*: This area of specialization provides the basis for understanding and influencing the underlying thought processes and attitudes that will ultimately determine the performance of individuals involved in sport, exercise, and other achievement oriented activities. The primary emphasis is to develop the scientific background and skills necessary for doctoral training and research.

Clinical exercise physiology: The purpose of this non-thesis program is to give students the opportunity to develop advanced knowledge and competencies in Exercise Physiology. Clinical Exercise Physiologists typically practice in hospitals, clinics and wellness centers as part of a health care team that administers tests and develops programs of exercise, counseling, and education for patients with cardiopulmonary, metabolic, and musculoskeletal diseases.

Exercise physiology: This thesis mandatory area of concentration is concerned with the scientific study of how the various physiological systems of the human body respond to physical activity. It is a multidisciplinary field with strong ties to the basic life sciences and medicine, and application to clinical, normal, and athletic populations.

Human performance: This non-thesis master's concentration merges a range of specializations within the Department into a curriculum that provides educational experiences to graduate students interested in studying the factors that determine human performance in both athletic and nonathletic domains. This flexible approach allows students to focus on specific applications that best meet their

individual interests. Human performance incorporates components such as nutrition, psychology, motor behavior, and physiology that are applicable to athletic and clinical populations.

APK 5127: Assessment in Exercise Science (3) *Prereq: PET 3351C or equivalent.* Techniques and methodologies to assess health and physical fitness.

APK 5404: Sport Psychology (3) *Prereq: Consent of instructor.* Survey of current research, learning processes, motivation, performance intervention, strategies, group dynamics, history of sport psychology, and other topics.

APK 6106: Clinical Anatomy for the Exercise Sciences (3) *Prereq: PET 2320C, 2350C, 3351C.* Cadaver dissection and lectures. Appreciation of clinical applications of anatomical knowledge for those pursuing careers in exercise science fields.

APK 6111L: Practicum in Exercise Physiology (3) *Prereq: APK 6110C.* Applied and experimental work emphasizing practical problems.

APK 6116C: Physiological Bases of Exercise and Sport Sciences (3) Applying fundamental concepts of human physiology to programs of physical education and sports. Recent research developments in sports physiology.

APK 6118: Neuromuscular Adaptation to Exercise (3) *Prereq: APK 6110C.* Research developments; and describing neural and muscular function and adaptation to acute and chronic exercise.

APK 6126: Cardiopulmonary Pathologies (3) *Prereq: PET 3350C, 3351C or equivalent.* Lecture and laboratory study of anatomy, physiology, and pathophysiology of cardiac and pulmonary systems. Attention to cardiopulmonary function in diseased and stressed states. Emphasizes dysfunction, clinical assessment, and rehabilitation of cardiopulmonary patients.

APK 6128: EKG Interpretation (3) *Prereq: PET 2350C and 3351C.* Basic and intermediate electrocardiography including cardiac function, lead systems, rate, axis, infarction, ischemia, hypertrophy, and effects of cardiovascular drugs and exercise on EKG. Particular attention to EKGs of diseased populations during exercise.

APK 6130: Human Pathophysiology for the Exercise Sciences (3) *Prereq: PET 2320C, 2350C, 3351C.* Macrotraumatic and microtraumatic inflammatory processes, factors affecting inflammation and healing, and the role of exercise in controlling the onset or course of an inflammatory response.

APK 6205C: Nature and Bases of Motor Performance (3) Principles of motor skill development, and conditions affecting motor skill development and retention in physical education activities.

APK 6206: Planning Motor Actions (3) *Prereq: consent of instructor.* Processes and mechanisms involved in planning voluntary human motor actions. Variables that influence movement planning and initiation.

APK 6210: Controlling Motor Actions (3) Analyzing human voluntary motor actions, including the mechanisms and systems involved in motor control.

APK 6225: Biomechanical Instrumentation (3) *Prereq: APK 6220C.* Overview of data collection and analysis tools. Hands-on experience conducting projects using EMG, videography, and force transducer technology.

APK 6226C: Biomechanics of Human Motion (3) *Prereq: PET 2320C; MGF 1202 or MAC 1142.* Applying the principles of statics, kinematics, and kinetics to kinesiological systems of the human body in movement and sports skills.

APK 6306: Athletic Training Research and Technology I (3) Current theory and practical application of techniques (cardiovascular testing, isokinetic strength testing, and EMG testing) for understanding and designing research projects related to athletic training and sports medicine.

APK 6307: Athletic Training Research and Technology II(3) *Prereq: NATA certified or eligible, or related degree or certification.* Current theory and practical application of techniques (modalities in research, proprioception testing, and force plate and balance testing) for understanding and designing research projects related to athletic training and sports medicine.

APK 6314: Evidence-Based Orthopedic Exam I: Upper-Extremity (3) *Prereq: for students who are BOC-certified athletic trainers.* Identifying, evaluating, and managing acute athletic injuries.

APK 6317: Rehabilitation and Modalities of Athletic Injuries (3) Rehabilitation and therapeutic modalities in the field of athletic training.

APK 6326: Seminar in Athletic Training (1-5; max: 5) *Prereq: NATA certification.* Research topics or contemporary issues in athletic training.

APK 6406: Exercise Psychology (3) Overview, examining research evidence on psychological factors associated with adapting and maintaining an exercise program.

APK 6408: Performance Enhancement (3) *Prereq: APK 5400.* Mental and psychological techniques and strategies to improve performance and achievement in sport and exercise.

APK 6410: Seminar in Exercise Psychology (3) *Prereq: APK 6405 or consent of instructor.* Critical review of the literature. Students design group research projects and pilot test.

APK 6415: Seminar in Sport Psychology: Current Topics (3) *Prereq: sport psychology course or consent of instructor.* Discussion of research topics, including contemporary issues and interests. In-depth exploration of research and theory. Citation of practical sport setting applications where appropriate.

APK 6900: Directed Independent Study (1-5; max: 12) Individual research projects under faculty guidance.

APK 6940: Advanced Practicum in Exercise and Sport Science (1-5; max: 5) On-site practical experience in exercise and sport science.

APK 6971: Research for Master's Thesis (1-15) S/U.

APK 7107: Cardiovascular Exercise Physiology (3) *Prereq: APK 6110C/6356L or equivalent.* Basic mechanisms of cardiovascular dynamics at rest and in response to exercise.
APK 7108: Environmental Stress Exercise Physiology (3) *Prereq: APK 6110C/6356L or equivalent.* Energetics of environmental stress on cardiovascular, respiratory, metabolic, and muscle physiology as they pertain to physical performance.
APK 7117: Exercise Metabolism (3) *Prereq: APK 6110C or equivalent.* Principles of metabolic regulation during exercise; effects of chronic exercise on muscle metabolism.
APK 7124: Free Radicals in Aging, Exercise and Disease (3) *Prereq: CHM 2040, APK 6110C or consent of instructor.* Free radical biology and biochemistry dealing with aging, exercise, antioxidants, and diseases of aging, such as atherosclerosis, diabetes, and neurodegenerative diseases.
APK 7129: Pulmonary Function during Exercise (3) *Prereq: APK 6110C or equivalent.* Regulation of pulmonary gas exchange during exercise; acute and experimental procedures during exercise.
HLP 6515: Evaluation Procedures in Health and Human Performance (3) Evaluation and interpretation of tests and analysis of research data.
HLP 6535: Research Methods in Health and Human Performance (3) Introduction to research methodology and design.
HLP 6911: Research Seminar (1; max: 6) Research presentations by graduate students and faculty in the College. S/U.
HLP 7979: Advanced Research in Health and Human Performance (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field, or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
HLP 7980: Research for Doctoral Dissertation (1-15) S/U.
PET 5936: Special Topics/Seminars (1-3)
PET 6314: Evidence-Based Orthopedic Exam II: Lower-Extremity (3) *Prereq: APK6314* Orthopedic and biomechanical assessment of lower-extremity function and dysfunction. Students develop skills and study the principles and procedures used in advanced evaluation techniques. Students examine components of lower-extremity function from biomechanical, neuromuscular and anatomical perspectives. Topics include advanced orthopedic special tests, 3-dimensional kinematics, interpreting contemporary diagnostic tests and treatment of lower-extremity pathology/dysfunction and critical reviews of related research.
PET 6910L: Supervised Research (1-5; max: 5) S/U.
PET 6947: Graduate Internship in Exercise and Sport Sciences (3-9; max: 9 [only 5 can count toward degree]) *Prereq: completion of 2 terms of course work applicable to specialization; permission of adviser, written application, and site approval.* On-site full-time practical experience in field of study. S/U.
PET 6948: Advanced Practicum (1-5; max: 5)
PET 6971: Master's Research(1-15) S/U.

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Architecture

College of Design, Construction, and Planning

Graduate Faculty

Director: M. Gold. *Graduate Coordinator:* N. M. Clark.
Complete faculty listing by department: Follow this link

Doctor of Philosophy: The college offers an interdisciplinary program leading to the Doctor of Philosophy degree in design, construction, and planning. Areas of specialization in this program include architecture, building construction, interior design, landscape architecture, and urban and regional planning. For information, write to the Ph.D. Director, College of Design, Construction, and Planning Doctoral Program, 331 ARCH, Box 115701.

Master of Architecture: The School of Architecture offers graduate work leading to the first professional degree, Master of Architecture. During graduate studies, each student has the opportunity to focus on one or more areas, including design, history and theory, urban design, preservation, structures, and technology. Concentrations and certificates are available in historic preservation, sustainable architecture, and sustainable design. The student's overall college experience, both undergraduate and graduate programs, is intended to be a complete unit of professional education leading to practice in architecture or related fields. Students entering the program at the University of Florida will matriculate in one of the following tracks:

Baccalaureate in Architecture base: For those students who have a 4-year baccalaureate degree from an accredited architectural program, 2 years in residence (52 credits) are normally required to

complete the Master of Architecture degree; notification of program length is part of the letter of acceptance and is determined by portfolio and transcript review. ARC 6241, ARC 6355, and ARC 6356 are required of all graduate students in this track and are prerequisites for the required thesis or master's project. Course sequences in history and theory, technology, structures, and practice must also be completed.

Baccalaureate in related degree base: For students who have a baccalaureate degree with an architecture or related major (interior design, landscape architecture) and who have completed 4 or 6 architecture or design studies courses, three years of residence (83 credits, approximately) are normally required to complete the Master of Architecture degree; notification of program length is part of the letter of acceptance and is determined by portfolio and transcript review. ARC 4073, ARC 4074, ARC 6241, ARC 6355, and ARC 6356 are required of all graduate students in this track and are prerequisites for the required thesis or master's project. (Undergraduate courses 3000 and 4000 level in the major do not count toward the minimum requirements for the graduate degree.) Course sequences in history and theory, materials and methods, technology, structures, and practice must be completed.

Baccalaureate in nonrelated degree base: For students with a baccalaureate degree in a nonrelated academic area and have completed fewer than 4 design studies courses, 4 years of residence (112 credits, approximately) are normally required to complete the Master of Architecture degree; notification of program length is part of the letter of acceptance and is determined by portfolio and transcript review. ARC 4071, ARC 407-2, ARC 4073, ARC 4074, ARC 6241, ARC 6355, and ARC 6356 are required of all graduate students in this track and are prerequisites for the required thesis or project. Undergraduate courses 3000 and 4000 level in the major do not count toward the 52-hour minimum requirements for the graduate degree. Course sequences in history and theory, materials and methods, technology, structures, and practice must be completed.

Accredited 5-year professional base: For students with a baccalaureate degree in architecture from an accredited 5-year professional degree program, a 1-year degree program is available. In these cases, a specialized curriculum is developed that compliments the needs of the applicant. Minimum registration is 30 credits; however, the minimum may increase if transcript reviews show that further course work is needed to meet registration and curriculum requirements. ARC 6356 is a prerequisite for the thesis or master's project.

Most states require individuals intending to become architects to hold an accredited degree. The National Architectural Accrediting Board acknowledges two types of degrees: the Bachelor of

Architecture (minimum 5 five years of study); and the Master of Architecture (minimum 3 years of study after an unrelated bachelor's degree, or 2 years after a related pre-professional bachelor's degree). These professional degrees educate those who aspire to registration and licensure to practice as architects.

Student work: The College may retain student work for the purpose of record, exhibition, or instruction.

Master of Science in Architectural Studies: The M.S.A.S. is a nonprofessional degree for advanced investigations in specialized areas of architectural history, architectural pedagogy, theory, technology, design, preservation, or practice. Students with a bachelor's degree in any discipline from an accredited university are eligible to apply to this program; the proposed area of focus should be precisely defined in the application. This is a 3- to 4-semester program (32 hours minimum) that includes a thesis. (No more than 6 hours of ARC 6971 may be counted in the minimum credit hours for the degree.) Interdisciplinary study is encouraged. Concentrations and certificates are available in historic preservation, sustainable architecture, and sustainable design.

The School sponsors special curricula in architecture to enhance the academic program. *Preservation Institute: Caribbean, Preservation Institute: Nantucket, and Vicenza Institute of Architecture (Italy)* accepts students from the University of Florida, and also from academic circles throughout the United States and the world for year-round study. Any student in a graduate architecture program at the University of Florida may apply for one or more of these programs.

Requirements for the M.Arch., M.S.A.S., and Ph.D. degrees are described in the *General Information* section of this catalog.

The School also participates in a program granting an Interdisciplinary Concentration and Certificate in Sustainable Architecture. For more information, see the *Interdisciplinary Graduate Studies* section of this catalog.

Applications: All applications for fall term graduate admission (including official transcripts, GRE scores, and TOEFL scores, if necessary) must be received by the Office of the Registrar by February 1. In addition to satisfying University requirements for admission, applicants are required to submit to the Graduate Program Assistant, School of Architecture, 231 ARCH, Box 115702, the following: a portfolio of their creative work; a scholarly statement of intent and objectives; and three letters of recommendation. This material must be received by February 1 to be considered for admission in the next fall term. Students may apply after the February 1 deadline but will only be considered if spaces become available. (Updates of portfolios are accepted after

February 1; however, applications will not be considered until they are complete.)

The School reserves the right to retain student work for purposes of record, exhibition, or instruction. Field trips are required of all students; students should plan to have adequate funds available. It may be necessary to assess studio fees to defray costs of base maps and other generally used materials.

ARC 5791: Topics in Architectural History (3)
ARC 5800: Survey of Architectural Preservation, Restoration, and Reconstruction (3)
ARC 5810: Techniques of Architectural Documentation (3) Documentation, interpretation, and maintenance issues relating to historic structures.
ARC 6176: Advanced Computer-Aided Design (3; max: 6) Available hardware and software and their current and potential usefulness to the profession. Future directions in hardware and software development.
ARC 6212: Topics in Phenomena and Architecture(3; max: 9) Relationships between the philosophy of phenomenology and specific phenomena and architecture studied. Current and historic examples of theoretical and design applications considered.
ARC 6226: Intercultural Perspectives in Architecture(3; max: 9) Studies on the impact of differing cultural practices displayed through politics, tourism, the arts and mass media on architectural thought and production.
ARC 6241: Advanced Studio I (1-9 ; max: 9) Architecture as a function of human action (program and use) and potentials inherent in construction (structure and material). The relationship between ritual and built form, culminating in a highly resolved spatial order.
ARC 6242: Research Methods (2) *Prereq: required of all graduate students as preparation for thesis.*
ARC 6280: Advanced Topics in Architectural Practice (3; max: 6) Analyzing contemporary practice models.
ARC 6281: Professional Practice (3) Principles and processes of office practice management, investment and financing, project phases, building cost estimation, contracts.
ARC 6355: Advanced Studio II (6) Relation between the tectonic and the experience of place. The joint, the detail, and the tactile reading of architecture, culminating in a highly resolved tectonic order.
ARC 6356: Advanced Studio III (6) Developing design methods for synthesizing special aspects of architectural practice: human behavior and space programming, environmental control and energy use, construction materials and structures, project management, preserving and reusing historic structures, and theoretical and philosophical areas of inquiry.
ARC 6357: Advanced Topics in Architectural Design (3; max: 6) Expanding familiar concepts in the conception and production of architecture. Examines the potential for a program to generate

architectonic form, bringing a multidisciplinary approach to historical manifestations.

ARC 6391: Architecture, Energy, and Ecology (3) Integration of energetic and environmental influences on architectural design.

ARC 6393: Advanced Architectural Connections (3) Analyzing architectural connections and details relative to selected space, form, and structural systems.

ARC 6399: Advanced Topics in Urban Design (3; max: 9) Transformations of historic urban form and newly developed urban areas and their cultural, sociological, economic, and technological impact.

ARC 6505: Architectural Structural Systems: Wood, Steel, and Concrete(4) *Prereq: ARC 3503 or equivalent.* Structural components as part of building system. Introduction to typical building components.

ARC 6576: Architectural Structures (3) Analysis and behavior of reinforced concrete, prestress, masonry, foundations, steel, and suspension systems.

ARC 6611: Advanced Topics in Architectural Technology (3; max: 6) Structures, materials, construction systems, or environmental technology. Determining architectural form by available technologies and inventions throughout history.

ARC 6621: Graduate Environmental Technology 2(3) *Prereq: ARC 3610.* Fundamentals of architectural lighting, acoustics, electrical power distribution, and building communications.

ARC 6642: Architectural Acoustics Design Laboratory (3) *Coreq: ARC 6643.* Theory and practice of architectural acoustics in solving design problems.

ARC 6643: Architectural Acoustics (3) Theory, practice, and application of acoustics in architecture.

ARC 6670: Lighting Design Seminar(3; max: 6) Design problems investigating theoretical, conceptual, and practical applications of illumination systems through speculative and analytical inquiry.

ARC 6685: Life Safety, Sanitation, and Plumbing Systems (3) Design problems investigating the theory, practice, and applications of fire safety, movement, sanitation, and plumbing systems in architecture.

ARC 6705: Graduate Architectural History 3 (3) *Prereq: ARC 1702.* Examination of key built works from early civilizations, their cultural context, and construction technologies.

ARC 6711: Architecture of the Ancient World (3) Examination of key built works from early civilizations, their cultural context, and construction technologies.

ARC 6750: Architectural History: America (3) Development of American architecture and the determinants affecting its function, form, and expression.

ARC 6773: Strains of Modernism(3; max: 9) Examinations of the origins, development and transformations of modernism as known through publications and built work of varying scales.

ARC 6793: Advanced Topics in Regional Architecture (3; max: 9) Critical studies of local, regional, and vernacular buildings and

built environments.
ARC 6805: Architectural Conservation (3) A multidisciplinary study, supervised by an architectural professor and another professor from an appropriate second discipline, in the science of preserving historic architecture, utilizing individual projects.
ARC 6821: Preservation Problems and Processes (3) Preservation in the larger context. Establishing historic districts; procedures and architectural guidelines for their protection.
ARC 6822: Preservation Programming and Design (3) Architectural design focusing on compatibility within the fabric of historic districts and settings.
ARC 6851: Technology of Preservation: Materials and Methods I (3) Materials, elements, tools, and personnel of traditional building.
ARC 6852: Technology of Preservation: Materials and Methods II (3) *Prereq: ARC 6851.* Preservation of twentieth-century structures.
ARC 6911: Architectural Research (1-6; max: 9) Special studies adjusted to individual needs. H.
ARC 6912: Architectural Research II (1-6; max: 9) Special studies adjusted to individual needs. H.
ARC 6913: Architectural Research III (1-6; max: 9) Special studies adjusted to individual needs. H.
ARC 6932: Advanced Topics in Architectural Methods (3; max: 9) Exploration of interconnection between architectural design and research methodology.
ARC 6933: Sustainable Site Design (3) *Prereq: must be a graduate student in the College of Design, Construction, and Planning.* Architecture's relationship to landscape environments. Focuses on architecture's interrelationship with the diverse fields of landscape architecture, ecology, and civil engineering.
ARC 6934: European Approach to Sustainable Design(3) Ideas and design strategies used in Europe that might be considered for the United States. Focuses on several countries in Europe that are leaders in sustainable design.
ARC 6935: Seminar in Sustainable Design(3) Overview of principles and practices of sustainable architecture design, including weekly reading, use studies of excellent design practices, local field trip, and on-campus practice.
ARC 6940: Supervised Teaching (1-5; max: 5) S/U.
ARC 6971: Research for Master's Thesis (1-15) S/U.
ARC 6979: Master's Research Project (1-10) H.
ARC 6xxa: Drawing toward Architecture (1-2; max: 2) Freehand drawing skills as generative and analytical architectural methodologies.
ARC 6xxaC: Building Information Modeling (3) *Prereq: ARC2180* Building information modeling (BIM) in the context of advanced architectural design development and documentation.
ARC 6xxx: St. Augustine Interdisciplinary Design Studio (2-6; max: 6) Advanced-level design, construction, and planning in St. Augustine, Florida with attention to cultural heritage and

interpretation.

DCP 6211: Preservation Topics, Issues, and Practice(3) Focuses on a critical assessment of current preservation practices and how they can be applied to a sustainable future. Historic preservation of existing buildings and landscapes embodies the concept of sustainable architecture and landscape architecture.

DCP 6710: History and Theory of Historic Preservation(3) National, state, and local historic preservation policies and programs are explored. Theoretical concepts that shape the way we view, protect, and preserve historic interiors, structures, sites, districts, and landscapes.

DCP 6711: History of the Built Environment for Preservation Practice (3) Historical developments in American cultural heritage through the study of buildings, sites, and figures.

DCP 6712: Preservation Technology: Conserving Modern Buildings (3) Principles and practices of physical conservation of culturally significant structures and sites of the Post World War II period.

DCP 6713: Historic Preservation: Principles, Practice, and Engineering (3) Principles and practices of physical conservation of culturally significant structures and sites. Presentation and study of contemporary advocacy, planning, and technology.

DCP 6714: Built Heritage Resources: Research, Documentation, And Conservation(3) Examines the principles and practices guiding the preservation of built heritage resources at three different scales: cultural and urban landscapes and building ensembles; architecture; and materials and finishes.

DCP 6931: Special Topics in Design, Construction, and Planning(1-4; max: 6)

DCP 6971: Research for Master's Thesis(1-9; max: 9) Research for master's thesis in Historic Preservation S/U.

DCP 7790: Doctoral Core I (3) Philosophy, theory, and history of inquiry into the processes of design, urban development, and building systems.

DCP 7792: Doctoral Core II (3) *Prereq: DCP 7790.* Urban, environmental, and legal systems in the context of urban development.

DCP 7794: Doctoral Seminar (1; max: 4) *Coreq: DCP 7911; for entering Ph.D. students.* Successfully negotiating graduate school and writing a dissertation.

DCP 7911: Advanced Design, Construction, and Planning Research I (3) *Prereq: STA 6167. Coreq: DCP 7794; for entering Ph.D. students.* Survey and critical analysis of research in the disciplines of design, construction, and planning. Emphasizes theory and methods.

DCP 7912: Advanced Design, Construction, and Planning Research II (3) *Prereq: DCP 7911.* Conducting advanced research in architecture, design, landscape, planning, and construction.

DCP 7940: Supervised Teaching (1-5; max: 5) *Prereq: not open to students who have taken 6940.* Independent student teaching under the supervision of a faculty member. S/U.

DCP 7949: Professional Internship (1-5; max: 5) Professional faculty-supervised practicum.
DCP 7979: Advanced Research(1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
DCP 7980: Research for Doctoral Dissertation (1-15) S/U.

Sustainable Architecture

ARC 6391: Architecture, Energy, and Ecology (3) Integration of energetic and environmental influences on architectural design.

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Art and Art History

College of Fine Arts

Graduate Faculty

Director: R.C. Heipp. *Graduate Coordinator:* L. Garber Lake.
Complete faculty listing by department: Follow this link

Master of Fine Arts degree: The school offers the M.F.A. degree in art with specializations in ceramics, creative photography, drawing, painting, printmaking, sculpture, graphic design, and digital media. Enrollment is competitive and limited. Candidates for admission should have adequate undergraduate training in art. Deficiencies may be corrected before beginning graduate study. Applicants must submit a portfolio for admission consideration. A minimum of 3 years residency is normally needed to complete the requirements for this degree, which for studio students culminates with an M.F.A. exhibition.
The M.F.A. requires a minimum of 60 credit hours: 24 hours must be in an area of specialization. Normal course requirements include:

--12 hours of studio electives outside the area of specialization
--6 hours of art history electives
--3 hours of aesthetics, theory, or criticism
--6 hours of electives
--6 hours of individual project or thesis research.

Although the M.F.A. is a thesis degree, students usually produce a creative project in lieu of thesis. Students should see the graduate program adviser for the School's requirements for the creative project. (Students electing to write a thesis must discuss the reasons with the graduate program adviser and the supervisory

committee during the second year and make appropriate modifications. ARH 5815 is required for all students who select the written thesis.)

Master of Arts degree in art education: The School offers the M.A. in art education. In addition to meeting requirements of the Graduate School for admission, prospective students should:

--Hold a degree in studio art, art history, or art education
--Send up to 10 images of original works of art (on CD or in slide form) and a research paper, article, or other sample of academic writing
--Send up to 10 images or photographs of student art work and a sample of curriculum materials if available
--Submit three current letters of recommendation.

The M.A. in art education requires a minimum of 36 credit hours. ARE 6047 and ARE 6148 are required. The basic plan of study includes 3 credits of an approved art education elective; 9 credits in studio courses; 3 credits in art history; 6 credits in art history, studio, art education, or education electives; 3 credits of ARE 6705; and 3 credits of ARE 6971 or ARE 6973. To be admitted to candidacy, students must pass a comprehensive examination at the beginning of the second year. The program culminates in an oral examination on the thesis or project in lieu of thesis.

Master of Arts and Doctor of Philosophy degrees in art history: The School offers graduate programs leading to the M.A. and Ph.D. degrees. For complete details of the M.A. and Ph.D. degree requirements, see the art history graduate adviser. Art history students may participate in courses offered by the State University System's programs in Paris, London, and Florence. Other study-abroad programs may be approved by the director of graduate studies.
For the M.A. degree, the School offers areas of emphasis in Ancient, Medieval, Renaissance/Baroque, Modern, and non-Western art history (including African, Asian, and Oceanic). A minimum of 36 credit hours is required: ARH 5815 (3 credits), 27 hours of course work, and ARH 6971 (6 credits). Required course work includes a minimum of 15 hours with 5 different art history Graduate Faculty (at least 12 hours of this course work must be graduate-level seminars). Nine credits may be taken in related areas with the graduate program adviser's approval. Reading proficiency in a foreign language appropriate to the major area of study must be demonstrated before thesis research is begun. Language courses cannot apply toward degree credit.

For the Ph.D. degree, the School offers the same areas of specialization as for the M.A. degree. Up to 30 credits from the M.A. degree may apply toward the 90 credit Ph.D. degree. A program of 60 credit hours beyond the M.A. degree is required. Core courses

will consist of a minimum of 30 hours in art history:

--18 hours in a primary area (5000-level or above)
--9 hours in a secondary area (5000-level or above)
--3 hours of theory/methodology of art history (if ARH 5815 or its equivalent has not been taken as part of the M.A.)
--An additional 12 hours of outside electives taken in other schools or departments are required in a discipline(s) related to the primary area of study
--Finally, 18 hours of dissertation research and writing is required.

By the end of the second semester or equivalent full-time study, students should form their supervisory committee that must include a minimum of four Graduate Faculty members; one of whom must agree to serve as primary dissertation adviser and supervisory committee chair. The supervisory committee will also act as the qualifying examination committee. Normally students will take the qualifying examination during the spring term of the third year in residence. The examination is both written and oral. It will cover the major and minor art history areas of emphasis as well as the student's preliminary formulation of a dissertation topic and provisional statement of the approaches to that topic as expressed in the dissertation prospectus.On successful completion of the qualifying examination, the approval by the supervisory committee of the dissertation prospectus, and fulfilling all other course and language requirements, the student makes formal application for a change of status to Ph.D. candidacy. Normally, a student will be expected to present the completed dissertation and defend it at an oral defense conducted by the supervisory committee by the end of the sixth year in the program. For Ph.D. students, reading knowledge of two research languages other than English must be demonstrated by the end of the second year of course work, or by the end of the first semester in the case of transfer students. Language courses are not applicable toward degree credit.

Master of Arts degree in museology (museum studies): The School offers this interdisciplinary program that consists of both academic and practical work. The curriculum allows students to do graduate work in a disciplinary emphasis (art history, anthropology, history, education, or the natural sciences) and at the same time complete a concentrated study in professional museum practices. The M.A. degree in museology requires 48 credit hours including:

--15 credits of museum studies courses (seminar, 3 credits; collections I, 3 credits; collections II, 3 credits; exhibitions, 3 credits; elective, 3 credits)
--15 graduate credits in a disciplinary focus
--6 credits of internship
--6 credits of electives
--6 credits of individual credit.

Several on-campus sites provide the program with laboratories for training students in museum work, including the University Galleries, Harn Museum of Art, Florida Museum of Natural History, and the "gallery" at the Reitz Union. Students must complete a 6-credit internship of at least 300 hours at an approved museum. In this experience, students are assigned to specific projects in which they will gain first-hand experience in museum work. The Harn Museum of Art or the Florida Museum of Natural History may be able to oversee a few interns, but students are encouraged to apply for internships at other U.S. institutions or abroad.

A project in lieu of thesis (or thesis) must be selected, researched, and carried out under the direction of a supervisory committee. Students register for project-in-lieu-of-thesis credits for 2 semesters. (If a thesis is chosen, it must be justified through the director and the supervisory committee, and 3 credits of Research and Methodology must precede thesis credit.)

ARE 6049: History of Teaching Art(3) History of the theory and practice of teaching art.
ARE 6148: Curriculum in Teaching Art (3) Contemporary theories for developing art teaching curricula.
ARE 6246C: Principles of Teaching Art (3) Social and theoretical foundations of contemporary art education practice.
ARE 6247C: Teaching Art: The Study of Practice (3) Art teaching practices in the public schools. Emphasizes art curriculum planning, motivational strategies, art room management and alternative assessment in art.
ARE 6386: Teaching Art in Higher Education () *Prereq: graduate standing in art history, or consent of instructor.* Study of teaching art at the post secondary level.
ARE 6441: Issues in Art Education(3) Exploration of contemporary issues in art, general education, and society that affect teaching of art in public schools.
ARE 6705: Methods of Research in Art Education (3) Study of qualitative and quantitative research methods. Review of research literature.
ARE 6905: Individual Study (1-5; max: 12)
ARE 6933: Special Topics in Art Education (1-3; max: 6)
ARE 6944: Internship in Teaching Art (3) *Prereq: student must be accepted into the MA Program in Art Education w/ EPI, have passed his/her first-year review, and have completed ARE 6X42 and ARE 6X43.* Develops pedagogical knowledge and skills in a school classroom, under the guidance of a K-12 art teacher. S/U.
ARE 6971: Research for Master's Thesis (1-15) S/U.
ARE 6973: Individual Project (1-10; max: 10) Project in lieu of thesis. S/U.
ARH 5357: French Art of the Ancien Regime: 1680-1780 (3) *Prereq: graduate standing in the Art History program, or consent of instructor.* Major artists, artistic movements, works and issues in art theory, and criticism in Europe from the late 17th century to the

1780s. Emphasizes painting in France and the reaction against Rococo.

ARH 5440: Beginnings of Modernism (3) *Prereq: ARH 2051 or consent of instructor.* Visual arts in Europe in the second half of the 19th century, focusing on the emergence of avant-garde and the formulation of the modern aesthetic in industrialized, urban culture, especially in Paris. Realism, Impressionism, and Post-Impressionism.

ARH 5441: Art in the Age of Revolution (3) *Prereq: ARH 2051 or consent of instructor.* Late-18th and early-19th century European art, including Neo-Classicism and Romanticism. Works are considered in the cultural, political, social, and aesthetic contexts in which they were created. Emphasizes the politics of style during the period of revolution and reaction.

ARH 5527: Arts of Central Africa (3) *Prereq: graduate standing in art history or consent of instructor.* Traditional arts of the equatorial forests, the savannahs to the south of them, and portions of eastern and southern Africa.

ARH 5528: Art of West Africa (3) *Prereq: graduate standing in art history or consent of instructor.* Traditional arts of western Sudan and the Guinea coast.

ARH 5655: Indigenous American Art (3; max: 9) *Prereq: ARH 2518 or consent of instructor.* Native arts of the Americas (North, Central, or South) from pre-European times.

ARH 5667: Colonial Andean Art (3) *Prereq: graduate standing in Art and Art History or Latin American Studies, or consent of instructor.* Examination of the colonial art of Peru, Ecuador, Bolivia, and other territories within the Spanish Viceroyalty of Peru.

ARH 5815: Methods of Research and Bibliography (3)

ARH 5877: Gender, Representation, and the Visual Arts: 1600-1900 (3) *Prereq: ARH 2051 or consent of instructor.* Historical and theoretical issues posed for visual media by attention to issues of gender, with particular emphasis on women artists.

ARH 5905: Individual Study (3-4; max: 12 including ART 5905C)

ARH 6292: Medieval Art Seminar (3; max: 12) *Prereq: graduate standing in art history or consent of instructor.* Topics in medieval art.

ARH 6394: Renaissance Art Seminar (3; max: 12) *Prereq: graduate standing in art history or consent of instructor.* Special topics in the art and visual culture of the 14th through 16th centuries.

ARH 6477: Eighteenth-Century European Art Seminar (3) *Prereq: graduate standing in the Art History program, or consent of instructor.* Intersecting ideologies of gender and representation in French art.

ARH 6481: Contemporary Art Seminar (3; max: 12) *Prereq: graduate standing in art history or consent of instructor.* Topics in contemporary art.

ARH 6496: Modern Art Seminar (3; max: 12) *Prereq: graduate standing in art history or consent of instructor.* Topics in modern art.

ARH 6596: Chinese Art Seminar (3; max: 12) *Prereq: graduate standing in art history or consent of instructor.* Research seminar focusing on a topic or topics in the study of Chinese art.
ARH 6597: African Art Seminar (3; max: 12) *Prereq: graduate standing in art history or consent of instructor.* Research seminar focusing on a topic or topics in the study of African art.
ARH 6654: Pre-Columbian Art Seminar (3) *Prereq: consent of instructor.* Rotating topics include topics pertaining to the study of Pre-Columbian art.
ARH 6666: Colonial Latin American Art Seminar (3) *Prereq: consent of instructor.* Rotating topics include issues pertaining to the study of colonial Latin American art.
ARH 6694: Nineteenth-Century Art–Seminar (3) *Prereq: graduate standing in the Art History program, or consent of instructor.*
ARH 6696: American Art Seminar (3; max: 12) *Prereq: graduate standing in art history or consent of instructor.* Topics in American art.
ARH 6797: Museum Education(3; max: 9) Issues and content related to education in museums and other nontraditional education settings.
ARH 6836: Exhibitions Seminar (3; max: 6) Basic information needed by the museum curator. Exhibition research, planning, interpreting, installing, and organizing and designing museum space.
ARH 6895: Collections Management Seminar (3; max: 9) Information needed to access and conserve objects. Risk management, preparing objects for travel, and legal issues in collections management.
ARH 6900: Independent Study in Museology(3-9; max: 9) Independent research topics under faculty guidance.
ARH 6910: Supervised Research (1-5; max: 5) S/U.
ARH 6911: Advanced Study (3-4; max: 16) *Prereq: major in art.*

ARH 6914: Independent Study in Ancient Art History (3-4; max: 12) *Prereq: major in art; consent of instructor and graduate program adviser.* Egyptian, Near Eastern, Aegean, Greek, Etruscan, Roman.
ARH 6915: Independent Study in Medieval Art History (3-4; max: 12) *Prereq: major in art; consent of instructor and graduate program adviser.* Early Christian, Byzantine, Early Medieval, Romanesque, Gothic.
ARH 6916: Independent Study in Renaissance and Baroque Art History (3-4; max: 12) *Prereq: major in art; consent of instructor and graduate program adviser.* Renaissance, High Renaissance, Mannerism, Baroque, Eighteenth Century art.
ARH 6917: Independent Study in Modern Art History (3-4; max: 12) *Prereq: major in art; consent of instructor and graduate program adviser.* Major art movements of the 19th and 20th centuries.
ARH 6918: Independent Study in Non-Western Art History (3-

4; max: 12) *Prereq: major in art; consent of instructor and graduate program adviser.* African, Latin American, American Indian, Asian, and Oceanic.

ARH 6930: Special Topics in Museology(3-9; max: 9) Contemporary issues pertaining to museums and their social and cultural functions.

ARH 6938: Seminar in Museum Studies (3) *Prereq: consent of instructor.* History, purposes, and functions of museums in general, and art museums in particular.

ARH 6941: Supervised Internship(3-6; max: 9) Training in an approved regional or national museum, arts organization, institution, or facility. On-site supervision, with periodic reports filed with the instructor of record. S/U.

ARH 6946: Museum Practicum (3) *Prereq: consent of graduate program adviser and prior arrangements with professors.* Work under museum professionals. Readings and periodic discussions with the coordinating professor.

ARH 6948: Gallery Practicum (3) *Prereq: consent of graduate program adviser and prior arrangements with coordinating professor.* Work under the supervision of gallery professionals. Readings and periodic discussions with the coordinating professor.

ARH 6971: Research for Master's Thesis (1-15) S/U.

ARH 6xxxFC: Greek Art Seminar (3; max: 12) *Prereq: graduate standing in art history or consent of instructor.* Topics in Greek art history.

ARH 7979: Advanced Research(1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

ARH 7980: Research for Doctoral Dissertation(1/15) S/U.

ART 5674C: Digital Fabrication (03) *Prereq: consent of instructor. Familiarity with 2-D and 3-D software recommended.* Interdisciplinary studio combines in-depth analysis of the role of the physical object in diverse conceptual art practices with project-based experimentation using rapid prototyping and manufacturing technologies.

ART 5905C: Individual Study (3-4; max: 12 including ARH 5905)

ART 5930C: Special Topics (3; max: 15) Rotating topics in studio art and studio practice.

ART 6671C: Advanced Experiments in Digital Art (3; max: 6) *Prereq: graduate student in Art and Art History or consent of instructor.* Rotating topics include electronic art forms, with an emphasis on creative and expressive use of emergent digital media, trends in digital media art.

ART 6672: Hypermedia (3) *Prereq: graduate level in School of Art and Art History or consent of instructor.* Practical and theoretical issues related to the Internet as a medium for making art rather than as tool for delivering information. Emphasizes creation of dynamic and interactive experiences that utilize the Internet

incuding video, graphics, animation, sound, image and typography.
ART 6673C: Video Art (3; max: 6) *Prereq: graduate level in School of Art and Art History or consent of instructor.* Studio intensive course explores digital video through lectures, demonstrations, screenings and reading with a specific overview of concepts and techniques integral to video. Emphasizes conceptual and experimental forms, rather than on conventional narrative.
ART 6691: Digital Art Studio (4; max: 12) *Prereq: graduate standing in art, or consent of instructor.* Investigation of digital art practices in one or more of the following areas: bit-mapped and object-oriented graphics, 3-D modeling, computer animation, hypermedia and interactivity, and image-processing.
ART 6835C: Research in Methods and Materials of the Artist (3-4; max: 8)
ART 6849C: Installation Using Digital Processes (3; max: 6) *Prereq: graduate level in School of Art and Art History or consent of instructor.* Explores site specificity and intervention in three-dimensional space through installation, using digital media, producing artworks expanding current body of work, intersecting with course theme.
ART 6897: Seminar: Practice, Theory, and Criticism of Art (3)
ART 6910C: Supervised Research (1-5; max: 5) S/U.
ART 6925C: Digital Media Workshop (3; max: 6) Examines the conceptual ramifications of new technologies, allowing the artist to experiment with new forms, in the context of a projects-based course, producing artworks, expanding their current body of work, as it intersects with the course theme.
ART 6926C: Advanced Study I (2-4; max: 12) *Prereq: major in art; consent of instructor and graduate program adviser.* Applying the basic principles of studio art in one of the following areas: ceramics, creative photography, drawing, painting, printmaking, sculpture, graphic design, or multi-media.
ART 6927C: Advanced Study II (2-4; max: 12) *Prereq: major in art; consent of instructor and graduate program adviser.* Investigating selected problems in one of the following areas: ceramics, creative photography, drawing, painting, printmaking, sculpture, graphic design, and multi-media.
ART 6928C: Advanced Study III (2-4; max: 12) *Prereq: major in art; consent of instructor and graduate program adviser.* Experimentation in nontraditional approaches to studio art in one of the following areas: ceramics, creative photography, drawing, painting, printmaking, sculpture, graphic design, and multi-media.
ART 6929C: Advanced Study IV (2-4; max: 12) *Prereq: major in art; consent of instructor and graduate program adviser.* Stylistic and technical analysis of contemporary studio practices in one of the following areas: ceramics, creative photography, drawing, painting, printmaking, sculpture, graphic design, and multi-media.
ART 6933: Special Topics (1-4; max: 12) *Prereq: consent of instructor and graduate program adviser.* Readings, discussions, and/or studio exploration of various art issues.
ART 6971: Research for Master's Thesis (1-15) S/U.

ART 6973C: Individual Project (1-10; max: 10) Creative project in lieu of written thesis. S/U.

ART 6xxxJC: Printmaking Seminar: Interdisciplinary Studio (3; max: 6) *Prereq: graduate standing in studio art or consent of instructor.* Explores diverse media and idea development as a way to develop innovative visual philosophies.

ART 6xxxK: Printmaking Seminar: Ideation, Studies, and Completed Works (3; max: 6) *Prereq: graduate standing in studio art or consent of instructor.* In-depth investigation of process, form, and content to strengthen previous visual philosophies.

ART 6xxxLC: Printmaking Seminar: Transformation and Change (3; max: 6) *Prereq: graduate standing in studio art or consent of instructor.* Explorations of methodologies toward conceptual and perceptual image transformations.

ART 6xxxM: Printmaking Seminar: Mastering Process and Content (3; max: 6) *Prereq: graduate standing in studio art or consent of instructor.* Complex ideation, approaches, and material handling to orchestrate a unified series of images that equally support concept and methods.

DIG 6746C: Graduate Seminar in Sensors and Electronics (3) *Prereq: digital media art students only, DIG 3130 (or equivalent programming experience) or consent of instructor.* Explores how devices respond to and interact with human physical action. Students create artwork, exploring physical interfaces beyond mouse/keyboard/screen interactions through the use of microcontrollers and sensors.

IDC 6505C: Programming for Artists (3; max: 6) *Prereq: graduate level in School of Art and Art History or consent of instructor.* Fundamental programming concepts that enable the digital artist to take full advantage of the range of computer-mediated interactivity.

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Astronomy

College of Liberal Arts and Sciences

Graduate Faculty

Chair: S. F. Dermott. *Graduate Coordinator:* A. H. Gonzalez.
Complete faculty listing by department: Follow this link

The Astronomy Department offers graduate programs leading to the M.S. or Ph.D. degrees in astronomy. Requirements for these degrees are given in the *General Information* section of this catalog. The University of Florida's Astronomy Department is one of the largest in the country. Research is an integral part of the graduate program. Students have opportunities to work with faculty and staff on a broad range of astronomical problems using in-house, national and international, and ground- and space-based facilities. Support for graduate studies is available through fellowships, research assistantships, and teaching assistantships.

The solar system: Researchers are active in studying the origins and orbital evolution of interplanetary dust and small bodies in the solar system (and around nearby stars). The properties of cosmic dust are studied using a microwave analog-to-light-scattering facility. The UF Radio Observatory (UFRO) is one of the largest observatories in the world dedicated to the study of decametric radio emission from the giant planets.

Stellar populations: Observational studies concentrate on resolved stars in the Milky Way and nearby galaxies. Studies of particular classes of stars include various types of binary stars and blue stragglers. In addition, the group maintains and disseminates the widely used Wilson-Devinney code. The goal of these studies is to

apply our theoretical understanding of stellar structure and evolution to the properties of stars in a variety of environments.

Origins of stars and planets: Observational studies focus on the properties of giant molecular clouds, the collapse of molecular cloud cores, the formation of stars in clusters and in isolation, and the formation and evolution of circumstellar and protoplanetary disks. Theoretical studies emphasize the influences of thermodynamics, velocity fields, and interface instabilities on star formation.

Structure and evolution of galaxies: Some observational programs use multi-wavelength photometry of stars and star clusters in galaxies throughout the Local Group and in nearby groups, including the Milky Way, to study galaxy evolution. Other observations focus on the structure and dynamics of galaxies using neutral hydrogen (H I) and molecules such as carbon monoxide (CO).

Extragalactic astronomy and cosmology: Observational programs investigate the nature of ultra-luminous galaxies, active galactic nuclei (AGNs), and the formation and chemical evolution of distant galaxies and clusters of galaxies. Theoretical investigations focus on the emission/absorption features in AGN spectra, the star-formation and chemical-evolution properties of galaxies, and applications of general relativity and particle physics to conditions in the very early universe.

Instrumentation programs: The UF Infrared Astrophysics Laboratory is a world leader in designing and constructing advanced near-infrared and mid-infrared instrumentation for major telescopes around the world, including the National Optical Astronomy Observatory, the 8m Gemini North and South Telescopes, and the 10m Gran Telescopio Canarias. The Laboratory for Astrophysics is a leading developer of satellite instruments for NASA and international space agencies to measure the optical properties of dust particles in diverse environments.

Computing facilities: The Astronomy Department maintains a network of high-performance computers running Linux, OS-X, and the Sun Solaris operating systems. The University campus also has several high-performance GRID supercomputing clusters that faculty can access for research and modeling. The local network is maintained by a full-time systems manager and a full-time support person.

AST 5113: Solar System Astrophysics I (3) *Prereq: 2 years of college physics.* Survey of the solar system, including its origin and laws of planetary motion. The earth as a planet: geophysics, aeronomy, geomagnetism, and the radiation belts. Solar physics and the influence of the sun on the earth.
AST 5114: Solar System Astrophysics II (3) *Prereq: AST 5113.*

The moon and planets; exploration by ground-based and spacecraft techniques. The lesser bodies of the solar system, including satellites, asteroids, meteoroids, comets; the interplanetary medium.

AST 6112: Solar System Astrophysics(3) Systematic examination of the formation and current state of the solar system.

AST 6215: Stellar Structure and Function (3) Theoretical approach to the study of stellar structure.

AST 6245: Stellar Atmospheres and Radiative Processes(3) Radiative transfer, spectral line formation and broadening, and other topics applicable to stellar atmospheres and photoionized nebulae.

AST 6309: Galactic and Extragalactic Astronomy (3) Observations and interpretations of the kinematics, dynamics, and structure of the Milky Way Galaxy, extragalactic objects, and galaxy clusters.

AST 6336: Interstellar Matter (3) Complex interplay of physical processes that determine the structure of the interstellar medium in our galaxy; compares observational data with theoretical prediction.

AST 6415: Observational Cosmology(3) Basic science and observations that underlie modern cosmology.

AST 6416: Physical Cosmology (3) Introduction to the observational background and to the theory of cosmology.

AST 6506: Celestial Mechanics (3) *Prereq: AST 3019.* Dynamics of the solar system, emphasizing the role of dissipative forces and resonant gravitational forces in determining the structure of the system.

AST 6725C: Observational Techniques (3) *Prereq: graduate student in astronomy.* Overview of techniques associated with observational astronomy.

AST 6905: Individual Work (1-6; max: 12) Supervised study or research in areas not covered by other courses.

AST 6910: Supervised Research (1-5; max: 5) S/U.

AST 6971: Research for Master's Thesis (1-15) S/U.

AST 7939: Special Topics (2-4; max: 12) Assigned reading, programs, seminar, or lecture series in a new field of advanced astronomy.

AST 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

AST 7980: Research for Doctoral Dissertation (1-15) S/U.

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Biochemistry and Molecular Biology

College of Medicine

Graduate Faculty

Chair: J. B. Flanegan. *Graduate Coordinator:* L. B. Bloom.
Complete faculty listing by department: Follow this link

Biochemistry and Molecular Biology Department faculty mentor Ph.D. students in the College of Medicine interdisciplinary program (IDP) in medical sciences. Students interested in pursuing a doctoral degree can view specific features of the biochemistry and molecular biology concentration at http://biochem.med.ufl.edu/ and http://idp.med.ufl.edu. For admission information, visit the IDP website. Department faculty also mentor Ph.D. students in other college programs and participate actively in the research and teaching functions of various centers such as the Center for Mammalian Genetics and the Center for Structural Biology. The Department offers a wide variety of courses for graduate students studying in the life sciences. The research expertise of the faculty spans the areas from cell biology, metabolism, and molecular biology to physical biochemistry/structural biology. Current research interests include viral protease inhibitors, viral RNA replication, bioenergetics and proton translocation, X-chromosome structure and function, cytoskeletal assembly and dynamics, enzyme mechanism and control, chromatin structure, gene expression and regulation, mitochondrial biogenesis and evolution, the genetics of inherited disease, nutrient membrane transporters, protein site-directed mutagenesis, ribosome structure and function, signal transduction, structural biology and dynamics of macromolecules, protein-nucleic acid interactions, transgenic animal models, and virus crystal structure. Prospective graduate students should have adequate

training in chemistry and biology. Minor deficiencies may be made up immediately after entering graduate school. Previous undergraduate experience in a research laboratory is highly recommended. Doctoral students are required to take a core IDP course in fall term of their first year; and beginning in spring term, students take advanced classes in areas of interest. Specific advanced-level courses may be recommended by the student's supervisory chair and committee. The following courses are open to all graduate students and advanced undergraduates. Additional courses are listed in the Advanced Concentration in Biochemistry and Molecular Biology section under Medical Sciences.

BCH 5413: Mammalian Molecular Biology and Genetics (3) *Prereq: BCH 3025, 4014, CHM 3218, 4207, MCB 4303, or PCB 3063 or consent of instructor.* Biochemical and genetic approaches to understanding vertebrate and particularly mammalian molecular biology, moving from basic processes of replication, transcription, and protein synthesis to signal transduction, cell cycle, cancer, genomics, and developmental genetics.

BCH 6040: Research Discussion in Biochemistry and Molecular Biology(1) *Prereq: Required as students in Biochemistry and Molecular Biology. Open to students in other fields with permission of the instructor.* Current research in biochemistry and molecular biology will be presented by departmental faculty and invited speakers. S/U.

BCH 6107: Biophysical Techniques in Proteomics and Protein Science (1) *Prereq: GMS 6001 or consent of instructor. Coreq: BCH 6740 or consent of instructor.* Theory and application of modern biophysical techniques relevant to proteomics and protein science.

BCH 6206: Advanced Metabolism (3) *Prereq: BCH 4024, CHM 4207, or consent of instructor. One of three core biochemistry courses.* Reactions of intermediary metabolism, emphasizing their integrations, mechanisms, and control. Extensive examples from current literature.

BCH 6207: Advanced Metabolism: Role of Membranes in Signal Transduction and Metabolic Control (1) *Prereq: BCH 3025, 4024, CHM 3218, 4207, GMS 6001, or consent of instructor.* Fundamentals of membrane biochemistry. Discussions of membrane structure, nutrient and ion transport, protein targeting, and signal transduction. Experimental methods and techniques used to gather and analyze data related to membrane biochemistry and its regulation.

BCH 6208: Advanced Metabolism: Regulation of Key Reactions in Carbohydrate and Lipid Metabolism (1) *Prereq: BCH 3025, 4024, CHM 3218, 4207, GMS 6001, or consent of instructor.* Key reactions in metabolic pathways of carbohydrate and lipid metabolism. Explores the experimental basis for current understanding of these processes. Understanding the interactions between major metabolic pathways and control of these pathways under different physiological conditions.

BCH 6209: Advanced Metabolism: Regulation of Key Reactions

in Amino Acid and Nucleotide Metabolism (1) *Prereq: BCH 3025, 4024, CHM 3218, 4207, GMS 6001, or consent of instructor.* Understanding interactions among major metabolic pathways and control of these pathways under different physiological conditions. Structural basis of enzyme function and regulation.

BCH 6296: Advanced Topics in Metabolic Control(1; max: 6) *Coreq: BCH 6206 or consent of instructor.* Thermodynamic, allosteric, hormonal, and genetic control of metabolic reactions.

BCH 6415: Advanced Molecular and Cell Biology (3) *Prereq: BCH 4024, CHM 4207, MCB 4303, or consent of instructor. PCB 3063 or a similar course in genetics recommended. One of three core biochemistry courses.* Molecular biology of pro- and eukaryotic organisms. Emphasizes understanding the experimental approaches that led to recent developments. Chromosome structure and organization, advances in recombinant DNA technology, DNA replication, RNA transcription and protein synthesis, and selected aspects of molecular regulation of gene expression.

BCH 6740: Physical Biochemistry/Structural Biology (3) *Prereq: BCH 4024, CHM 4207, or consent of instructor. Course in physical chemistry recommended. One of three core biochemistry courses.* Physical chemistry of biological molecules and techniques to study their properties. Approaches to structure determination.

BCH 6741C: Magnetic Resonance Imaging and Spectroscopy in Living Systems (1-3; max: 3) *Prereq: BCH 6740 or equivalent or consent of instructor.* MR imaging methods used to study the structure of cells, tissues, and whole animals. MR spectroscopy methods for monitoring biochemistry in living animals. Preparing samples, operating the instruments, and analyzing the data.

BCH 6743: Biochemical Energetics (1) *Prereq: BCH 3025, CHM 3216, 4207, or consent of instructor.* Molecular and structural interpretation of energy transformation in biological systems including protein-protein interaction, protein self-assembly, and protein-nucleic acid interaction. S/U.

BCH 6744: Molecular Structure Determination by X-ray Crystallography (1; max: 2) *Prereq: BCH 6740 or equivalent or consent of instructor.* Detailed theoretical and practical instruction on technique of x-ray crystallography used for three-dimensional structure determination of macromolecules in studies aimed at structure-function elucidation.

BCH 6744L: Molecular Structure Determination by X-Ray Crystallography Laboratory(1) *Prereq: or coreq: BCH 6744.* Complement to BCH 744 lectures. Practical experience in sample preparation, operation of instrumentation, data acquisition analysis, phasing and refinement. Hands-on approach reinforces applicability of this methodology in analysis of functional properties of biological macromolecule.

BCH 6745: Molecular Structure and Dynamics of NMR Spectroscopy(1; max: 2) *Prereq: BCH 6740 or equivalent or consent of instructor.* Theoretical and practical introduction to macromolecular NMR spectroscopy. Basics of multidimensional NMR for structure and dynamics measurements. Hands-on training in

modern NMR.

BCH 6745L: Molecular Structure and Dynamics by NMR Spectroscopy Laboratory(1) *Prereq: or coreq: BCH 6745.* Complement to BCH 6745 lectures. Emphasizes practical applications of molecular structure and dynamics determination. Extensive use of computer software packages. Training in modern NMR instrumentation, data processing, and data analysis. Completed training sufficient for use of NMR instrumentation in Advanced Magnetic Resonance Imaging and Spectroscopy facility.

BCH 6746: Structural Biology: Macromolecular Structure Determination (1; max: 3) *Prereq: BCH 3025, 4024, CHM 3218, 4207, GMS 6001 or consent of instructor.* Experimental approaches to biological macromolecular structure determination. Emphasizes current understanding of protein-protein and protein-nucleic acid structure motifs.

BCH 6747: Structural Biology/Advanced Physical Biochemistry: Spectroscopy and Hydrodynamics (1) *Prereq: BCH 3025, 4024, CHM 3218, 4207, GMS 6001, or consent of instructor.* Applying spectroscopic techniques (circular dichroism, fluorescence, nuclear magnetic resonance) to determine the structure of biological macromolecules. Hydrodynamic approaches including light scattering, molecular diffusion, viscosity, and ultracentrifugation.

BCH 6749C: Numerical Methods in Structural Biology(1) *Prereq: BCH 6740 or equivalent or consent of instructor.* Introduction to mathematical and computational methods needed to understand current structural models, biophysical processes, data acquisition methods, and analysis of data acquired with current techniques.

BCH 6876: Recent Advances in Membrane Biology (1) *Prereq: general biochemistry or consent of instructor.* Literature presented by students and faculty, discussed in depth. Emphasizes current developments, data, interpretation, and critical analysis. S/U.

BCH 6877: Recent Advances in Structural Biology (1; max: 8) *Prereq: general biochemistry or consent of instructor.* Literature on structural biology presented by students and faculty, discussed in depth. Current developments, data interpretation, and critical analysis. S/U.

BCH 6878: Recent Advances in Cytoskeletal Processes (1; max: 8) *Prereq: general biochemistry or consent of instructor.* Literature on cytoskeletal processes presented by students and faculty, discussed in depth. Current developments, data interpretation, and critical analysis. S/U.

BCH 6905: Independent Studies in Biochemistry and Molecular Biology (1-5; max: 12) *Prereq: permission of instructor.* Individual literature-based or experimental research problem.

BCH 6910: Supervised Research (1-5; max: 5) *Prereq: consent of instructor.* S/U.

BCH 6936: Biochemistry Seminar (1; max: 20) *Prereq: required of graduate students in biochemistry; open to others by special arrangement.* Research reports and discussions of current research

literature given by graduate students, departmental faculty, and invited speakers.

BCH 6971: Research for Master's Thesis (1-15) *Prereq: consent of instructor.* S/U.

BCH 7410: Advanced Gene Regulation (1; max: 3) *Prereq: GMS 6001 or consent of instructor.* Literature-based assessment of the most recent advances in factors governing eukaryotic gene regulation.

BCH 7412: Epigenetics of Human Disease and Development(1) *Prereq: GMS 6001. BCH 6415 recommended.* In-depth assessment of epigenetic mechanisms of mammalian gene regulation: DNA methylation, histone modifications, genomic imprinting, inherited genetic diseases, viral gene regulation, and epigenetic reprogramming in embryonic stem cells and cloning.

BCH 7414: Advanced Chromatin Structure (1) *Prereq: BCH 5413, GMS 6001, or consent of instructor.* Lecture and literature-based assessment of chromatin structure.

BCH 7515: Structural Biology / Advanced Physical Biochemistry: Kinetics and Thermodynamics (1) *Prereq: BCH 4024, CHM 3218, 4207, GMS 6001, or consent of instructor.* Fundamentals of chemical kinetics and thermodynamic analysis of equilibria. Emphasizes applying this knowledge to understand basic enzyme kinetics, pulse-chase kinetics, protein polymerization, DNA dynamics, protein-nucleic acid interactions, and cooperative ligand binding.

BCH 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

GMS 6195: Epigenetics Journal Club (1; max: 12) *Prereq: consent of instructor.* Presentation and critical discussions of recent original papers published in high-impact journals relating to the topic of epigenetics. S/U.

GMS 6xxxCC: Crystallography and Cryo-Electron Microscopy (1; max: 4) *Prereq: BCH 6740 or equivalent, or consent of instructor.* Journal club covering current literature on methodologies, applications, and discoveries in crystallography and cryo-electron miscroscopy. S/U.

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Biomedical Engineering

College of Engineering

Graduate Faculty

Chair: B. Wheeler. *Graduate Coordinator:* H. van Oostrom. *Complete faculty listing by department*: Follow this link

The mission of the J. Crayton Pruitt Family Department of Biomedical Engineering (BME) is to educate students with strong engineering and science backgrounds for master's and/or Ph.D. degrees in biomedical engineering. Graduates in BME typically apply their skills and training directly to engineering solutions to clinical problems in medicine. The BME mission is accomplished through a core program of study that has strong collaborations with faculty in the Colleges of Engineering and Medicine. The Biomedical Engineering Department faculty includes joint, affiliate, and adjunct appointments with other departments in the College of Engineering, the College of Medicine, and local industry. This diversity ensures students the highest-quality education and opportunity for research. The BME Department currently focuses on six principal areas: biomechanics, cellular and tissue engineering, biomedical imaging and signal processing, cardiac engineering, neural engineering, and bio-micro-electromechanical systems. The Department has major ongoing research in areas such as biomaterials, medical imaging, biomechanics, anesthesiology, neuroscience, tissue engineering, transplantation, and cardiology. Although these programs are usually centered in other departments, they provide strong support for the academic dimensions of BME. A web page (http://www.bme.ufl.edu) contains additional information on admissions requirements, faculty, and research projects.

The BME graduate students are admitted directly through the BME Department. The BME Graduate Academic Committee reviews and makes all decisions regarding admission. Each student's research adviser must hold a Graduate Faculty appointment in the BME Department. Supervisory committees for BME students normally include at least one member from the College of Engineering and one from the College of Medicine to emphasize the need for a clinical focus in the research.

The master's degree (thesis or nonthesis) requires at least 30 semester hours. The Ph.D. degree requires at least 90 semester credit hours beyond the bachelor's degree. No more than 30 hours of a master's degree from another institution will be transferred to the Ph.D. degree. If a student holds a master's degree in a discipline different from the doctoral program, the master's work will not be counted toward the doctoral degree unless the BME Department successfully petitions the Dean of the Graduate School. Requirements for these degrees are given in the *General Information* section of this catalog. Complete BME program details and courses available are listed in the Biomedical Engineering Graduate Guidelines, on the BME web site (which also offers information on available areas of study). Graduate-level courses in either the College of Engineering or the College of Medicine may be applied toward the BME degree programs with the approval of the supervisory committee chair and the graduate coordinator.

Combined program: Biomedical Engineering also offers a combined bachelor's/master's degree program in collaboration with the other departments in the College of Engineering. This program allows qualified students to earn both a bachelor's degree and a master's degree within 5 years for a net savings of 1 year.

BME 5085: Patents, Product Development, and Technology Transfer (2) For engineers and scientists. Product discovery and development; patents and trade secrets; copyright and trademark law; international intellectual property considerations; regulatory issues; business planning and market research; and licensing, marketing, negotiation, and technology transfer.
BME 5401: Biomedical Engineering and Physiology I (3) Physiology of cells, bones, and the circulatory system from a biomaterials, biomechanics, cellular, and tissue engineering perspective. Intellectual property and technology transfer included.
BME 5402: Biomedical Engineering and Physiology II (3) Physiology of the human body, imaging techniques, and subsequent processing. Discusses various imaging modalities and appropriate processing methods for revealing the details of physiology and diagnosis.
BME 5500: Biomedical Instrumentation (3) *Prereq: basic knowledge of physics and calculus, consent of instructor.* Engineering and medical aspects of measuring and processing signals from living systems. Discusses biomedical transducers for

measuring movement, biopotentials, pressure, flow, concentrations, and temperature; and treatment devices like ventilators and infusion pumps. Whenever possible, devices actually used in clinical practice are used in class.

BME 5703: Computational Methods for Biomedical Engineering(3) *Prereq: Knowledge of calculus, linear algebra and basic statistics.* Computational methods needed for biomedical engineering research. Students will be acquainted with a variety of techniques for analyzing and modeling experimental data arising in molecular, cellular, physiological, and pathological systems encountered in typical laboratory and clinical settings.

BME 5937: Special Topics (1-4; max: 6)

BME 5xxx: Biomedical Engineering Laboratory (3) Integrates state-of-the-art technologies with a hands-on approach to education in a flexible system of academic topics tailored for specific disciplines within biomedical engineering, by teaching primary laboratory skills, experimental design, interpretation of data, and technical writing relevant to laboratory work.

BME 5xxxa: Molecular Biomedical Engineering (3) Fundamentals of molecular biology for biomedical engineers.

BME 6010: Clinical Preceptorship (3; max: 6) Students observe clinical faculty and work with engineering faculty to examine current clinical practice and restraints with goal to propose jointly possible improvements.

BME 6088: BME Problem Based Learning II (2) *Prereq: BME 6087. For graduate-level students only.* Team-based interdisciplinary advanced problem-solving. Students devise solutions and approaches to topical and real-world biomedical engineering problems and technologies.

BME 6330: Cell and Tissue Engineering (3) *Prereq: GMS 6421, BME 5001, or consent of instructor.* Applying engineering principles, combined with molecular cell biology, to developing a fundamental understanding of property-function relationships in cells and tissues. Exploiting this understanding to manipulate cell and tissue properties rationally to alter, restore, maintain, or improve cell and tissue functions; and to design bioartificial tissue substitutes.

BME 6360: Neural Engineering (3) *Prereq: consent of instructor.* Applying engineering to neuroscience including such diverse areas as neural tissue engineering, models of neural function, and neural interface technology. Focuses mainly in the context of neural interfaces and prosthetics, from basic neural physiology and models of neural mechanisms to advanced neural interfaces currently in development or produced commercially.

BME 6502: Introduction to Medical Imaging (3) Modern medical imaging technologies from a biomedical engineering perspective. The physics, mathematics, instrumentation and clinical applications of all common medical imaging modalities including x-ray radiography, computed tomography (CT), ultrasound imaging, positron emission tomography (PET), and magnetic resonance imaging (MRI) with a focus on non-ionizing radiation will be discussed. Emerging imaging modalities including diffuse optical tomography (DOT), Fluorescence

Molecular Tomography (FMT), and photoacoustic tomography (PAT) will also be introduced.

BME 6522: Biomedical Multivariate Signal Processing (3) *Prereq: multivariate calculus and a basic knowledge of probability and statistics.* Statistical analysis of biomedical signals, emphasizing multivariate time series. Introduces analysis concepts and methods in the time domain and the spectral domain. Uses actual recordings from biomedical applications to demonstrate the methods.

BME 6705: Mathematical Modeling of Biological and Physiological Systems (3) *Prereq: calculus, linear algebra, and passing knowledge of differential equations.* Mathematical modeling of biological and physiological phenomena. Starting from basic theory of linear systems, introduces qualitative analysis of nonlinear ordinary differential equations and maps. Examples from biomedical applications show concepts and methods.

BME 6905: Individual Work in Biomedical Engineering (1-4; max: 8)

BME 6910: Supervised Research (1-5; max: 5) S/U.

BME 6936: Biomedical Engineering Seminar (1; max: 4)

BME 6938: Special Topics in Biomedical Engineering (1-4; max: 6)

BME 6940: Supervised Teaching (1-5; max: 5) S/U.

BME 6971: Research for Master's Thesis (1-15) S/U.

BME 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

BME 7980: Research for Doctoral Dissertation (1-15) S/U.

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Botany

Colleges of Liberal Arts and Sciences and Agricultural and Life Sciences

Graduate Faculty

Chair: A. C. Harmon. *Graduate Coordinator:* Rebecca Kimball.
Complete faculty listing by department: Follow this link

The Department of Botany offers graduate work leading to the degrees of Master of Science, Master of Science in Teaching, and Doctor of Philosophy. Requirements for these degrees are given in the General Information section of this catalog.

The Department offers studies in the areas of biochemistry, molecular biology, cell biology, physiology, ecology, systematics, and evolution. Specific areas of specialization include anatomy/morphology with emphasis on extant and fossil vascular plants; ecology and environmental studies including ecosystem ecology, conservation biology and genetics, fire ecology, exotic invasive species, and tropical botany and ecology; cell biology with emphasis on the cytoskeleton and cell morphogenesis; physiology, biochemistry, and molecular biology with emphasis on photosynthesis, growth and development of angiosperms, protein phosphorylation and signal transduction, global analysis of spatial patterns of gene expression; plant secondary metabolism and proteomics; systematics with emphasis on DNA- and morphology-based phylogenetic analyses, phylogeographic studies, molecular evolution/development, and monographic and floristic studies. To be considered for admission to graduate studies, students should have:

--The equivalent of an undergraduate degree in botany or biology with basic course work in their area of interest

--Acceptable GRE scores (verbal, quantitative, and analytical writing)

--Letters of recommendation

International students must submit an acceptable score on one of the following: TOEFL (Test of English as a Foreign Language: computer=213, paper=550, web=80), IELTS (International English Language Testing System: 6), MELAB (Michigan English Language Assessment Battery: 77), or successful completion of the UF English Language Institute program. The program of graduate study for each student will be determined by a supervisory committee, and deficiencies in background coursework will be made up early in the graduate program. No more than 9 credits of BOT 6905 may be used to satisfy the credit requirements for a master's degree.

BOT 5115: Paleobotany (3) *Prereq: upper-level course in botany or geology; or consent of instructor.* Comparative study of plants through geologic time with attention to morphology and evolution of major groups of land plants, based on the fossil record. Offered spring term in odd-numbered years.

BOT 5225C: Plant Anatomy (4) *Prereq: BOT 2011C or 3303C; or consent of instructor.* Origin, structure, and function of principal cells, tissues, and vegetative and reproductive organs of seed plants. Offered fall term.

BOT 5505C: Intermediate Plant Physiology(3) *Prereq: BOT 3503/3503L and CHM 2200/2200L or equivalent.* Fundamental processes underlying water relations, metabolism, growth, and reproduction of plants. Overview of plant physiological and biochemical processes for plant science students. Basic information about plant processes integrated with agronomical and environmental considerations.

BOT 5625: Plant Geography (2) *Prereq: BOT 3151C or 5725C.* Geography of the floras and types of vegetation throughout the world, with emphasis on problems in the distribution of taxa, and the main factors influencing types of vegetation. Offered fall term in even-numbered years.

BOT 5655C: Physiological Plant Ecology (3) *Prereq: basic plant physiology or consent of instructor.* Traits affecting success in different environments (emphasizing energy balance, carbon balance, water relations, and nutrient relations). Introduction to ecophysiological methods and instrumentation. Offered fall term in even-numbered years.

BOT 5685C: Tropical Botany (5) *Prereq: elementary biology/botany; consent of instructor.* Study of tropical plants using the diverse habitats of South Florida (emphasizing uses, anatomy and morphology, physiology and ecology, and systematics of these

plants). Field trips and the Fairchild Tropical Garden supplement laboratory experiences. Offered summer term.

BOT 5695: Ecosystems of Florida (3) *Prereq: basic ecology; and consent of instructor.* Major ecosystems of Florida in relation to environmental factors and human effects. Emphasis on field trips (Saturdays and some overnights). Offered spring term in odd-numbered years.

BOT 5725C: Taxonomy of Vascular Plants (4) *Prereq: BOT 2011C and 3303C or equivalent.* Introduction to systematic principles and techniques used in classification; field and herbarium methods. Survey of vascular plants, their classification, morphology, and evolutionary relationships. Offered spring term in odd-numbered years.

BOT 6516: Plant Metabolism (3) *Prereq: BOT 5505C, BCH 4024.* Metabolism of carbohydrates, fats, and nitrogen compounds in higher plants; cell structures as related to metabolism; metabolic control mechanisms. Offered fall term.

BOT 6566: Plant Growth and Development (3) *Prereq: BOT 5505C.* Fundamental concepts of plant growth and development with emphasis on the molecular biological approach. Offered fall term in even-numbered years.

BOT 6716C: Advanced Taxonomy (2) *Prereq: BOT 5725C or equivalent.* Survey of vascular plant families of limited distribution and/or of phylogenetic significance not covered in BOT 5725C. Discuss their classification, morphology, and evolutionary relationships. Review published studies to demonstrate principles and methods involved in classification. Offered on demand.

BOT 6905: Individual Studies in Botany (1-9; max: 9) *All credits in excess of 3 must be approved by department chair or graduate coordinator.* Individual nonthesis, research problem in one of the following areas of botany: ecology, physiology and biochemistry, cryptogamic botany, morphology and anatomy of vascular plants, systematics, cytology, genetics, and ultrastructure. Topics selected to meet the interests and needs of students.

BOT 6910: Supervised Research (1-5; max: 5) S/U.

BOT 6927: Advances in Botany (1-3; max: 9) Supervised study in specific areas.

BOT 6935: Special Topics (1-4; max: 9)

BOT 6936: Graduate Student Seminar (1-2; max: 9) Readings and oral presentation on general topics in botany. S/U.

BOT 6940: Supervised Teaching (1-5; max: 5) S/U.

BOT 6943: Internship in College Teaching (1-6; max: 6) Required for Master of Science in Teaching candidates but available for students needing additional practice and direction in college-level teaching.

BOT 6971: Research for Master's Thesis (1-15) S/U.

BOT 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

BOT 7980: Research for Doctoral Dissertation (1-15) S/U.
PCB 5046C: Advanced Ecology (3) *Prereq: basic ecology and one course in statistics; physics, chemistry, and physiology desirable.* Ecological research skills, emphasizing design of field studies and data analysis. Offered fall term in odd-numbered years.
PCB 5338: Principles of Ecosystem Ecology (3) *Prereq: BSC 2010 or BSC 2011, and PCB 3034C or PCB 4044C.* Examines principles that govern the structure and function of terrestrial ecosystems. Ecosystem Ecology is the study of flows of energy and materials between organisms and their environment.
PCB 5356: Tropical Ecology (3) *Prereq: elementary biology or consent of instructor.* Global overview of tropical environments, natural history, biological communities, and their structure and function. Addresses basic and applied ecological issues in the tropics.
PCB 6176: Electron Microscopy of Biological Materials (2) *Prereq: MCB 3020 or equivalent.* Use of the electron microscope, including fixation, embedding, sectioning, freeze-etching, negative staining, and use of vacuum evaporator.
PCB 6176L: Laboratory in Electron Microscopy (2) *Coreq: PCB 6176 and consent of instructor.* Laboratory training in using electron microscopes, ultramicrotomes, vacuum evaporators, and freeze-etch machines.
PCB 6605C: Principles of Systematic Biology (4) Theory of biological classification and taxonomic practice. Laboratory experience in taxonomic procedures and techniques, including computer methods. Offered spring term in even-numbered years.

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Building Construction

College of Design, Construction, and Planning

Graduate Faculty

Director: A. R. Chini. *Graduate Coordinator:* R. Issa.
Complete faculty listing by department: Follow this link

Doctor of Philosophy: The college offers an interdisciplinary doctoral program in design, construction, and planning. Areas of specialization in the program include architecture, building construction, interior design, landscape architecture, and urban and regional planning. Within the area of building construction, specialization options include sustainable construction, information systems, construction safety, affordable housing, productivity, and human resource management. These specializations prepare students to assume college-level faculty positions and industry research positions in construction management and the building sciences. For more information on the Ph.D. program, write to the Ph.D. Director, College of Design, Construction, and Planning Doctoral Program, 331 ARCH, P.O. Box 115701. For information on the specializations in the Rinker School of Building Construction, write to the Director of Graduate and Distance Education, Rinker School of Building Construction, 304 Rinker Hall, P.O. Box 115703.

The M.E. Rinker Sr. School offers courses leading to the degrees of Master of Science in Building Construction (thesis), Master of Building Construction (nonthesis), and Master of International Construction Management (nonthesis distance education program for experienced professionals). An individual plan of study is prepared for each student to insure that the student's goals are achieved within the broad policy guidelines of the Rinker School.

Specialization may be in such areas as construction management, sustainable construction, information systems, construction safety, and construction law. Requirements for the M.B.C., M.S.B.C., M.I.C.M., and Ph.D. degrees are given in the *General Information* section of this catalog.

Master of Building Construction (M.B.C.) or Master of Science in Building Construction (M.S.B.C.): To be eligible for admission to the M.B.C. or M.S.B.C. programs, a student must hold a 4-year undergraduate degree in building construction or its equivalent in related fields. "Equivalent in related fields" should include studies in construction materials and methods, structures, and management. Students with deficiencies in these related fields may need longer residence for the master's degree, as they will be required to take specified basic courses to provide a foundation for advanced courses. There is no foreign language requirement.

No more than 3 credits of BCN 6971 may be used to satisfy the credit requirements for the M.S.B.C. degree without written permission of the Director of Graduate and Distance Education Programs.

Master of International Construction Management (M.I.C.M.): This program prepares students to assume upper-level management responsibilities in a multinational company. To be eligible for admission to the M.I.C.M. program, a student must have:

--A 4-year undergraduate degree
--At least 5 years of meaningful, supervisory-level construction management experience
--Acceptable GRE scores (verbal, quantitative, and analytical writing)
--A grade point average of 3.0 on a 4.0 scale
--Employer sponsorship
--International students must submit an acceptable score on one of the following: TOEFL (Test of English as a Foreign Language: computer=213, paper=550, web=80), IELTS (International English Language Testing System: 6), MELAB (Michigan English Language Assessment Battery: 77), or successful completion of the UF English Language Institute program.

No more 3 credits of ICM 6934 may be used to satisfy the credit requirements for the M.I.C.M. without written permission of the Director. All candidates are required to take ICM 6930. In addition to these 6 research-oriented graduate credit hours, the student selects one or two areas of emphasis and then takes the rest of the required 33 credit hours from the remaining courses and special electives. All candidates are required to pass a comprehensive oral and/or written examination at the completion of the course work and their master's research report/project.

The M.E. Rinker Sr. School reserves the right to retain student work for purposes of record, exhibition, or instruction.

Research facilities: The Shimberg Center for Affordable Housing, operating within the School, researches the problems and possible solutions associated with developing and producing affordable housing. The Powell Center for Construction and the Environment conducts research on implementing sustainability in creating, operating, and constructing a built environment. The Fluor Program for Construction Safety researches and disseminates information on matters related to construction safety and health. The Center for Collective Protection promotes interdisciplinary activities to develop technology and planning guidance needed to enhance the nation's ability to mitigate the human, economic, and environmental consequences of natural hazards and terrorist events.

Combined program: The School offers a bachelor's/master's degree program. Contact the graduate coordinator for information.

BCN 5470: Construction Methods Improvements (3) *Prereq: graduate standing.* Methods of analyzing and evaluating construction techniques to improve project time and cost control. Work sampling, productivity ratings, crew balance studies, time lapse photography, and time management.
BCN 5618C: Comprehensive Estimating(3) *Prereq: graduate standing.* Classification of work and quantity survey techniques. Analysis and determination of costs of construction operations including direct and overhead costs, cost analysis, and preparation of bid proposals.
BCN 5625: Construction Cost Analysis (3) *Prereq: BCN 4612C/5618C, 4720/5722, graduate standing.* Study of cost engineering and cost distribution and comparative analysis of actual and estimated cost as used for project control.
BCN 5705C: Project Management for Construction (3) *Prereq: BCN 5618, 6748, non-BCN graduate.* Project organization, site planning, and implementation.
BCN 5715: Advanced Construction Labor Problems (3) *Prereq: graduate standing.* Labor problems in the construction industry and associated legislation. How to work effectively with unionized labor on construction projects.
BCN 5722: Advanced Construction Planning and Control (3) *Prereq: BCN 4720, graduate standing.* Time-cost relationships for various construction operations.
BCN 5737: Advanced Issues in Construction Safety and Health (3) *Prereq: BCN 4735, graduate standing.* Current construction safety and health issues. Development of specific methodology to provide hazard reduction on job sites.
BCN 5754C: Site Development (3) Principles and practices of land development including market analysis, site analysis, project programming, and financial feasibility.
BCN 5776: International Construction Business Management

(3) *Prereq: BCN 6748, graduate standing.* Construction contracting, emphasis on international economics, marketing, contracts, design, and specifications.

BCN 5779: Facilities Operation and Maintenance (3) *Prereq: graduate standing.* Facilities management as a specialized professional career; study of how a facility, its people, equipment, and operations are served and maintained.

BCN 5789C: Construction Project Delivery (3) *Prereq: BCN 5618, 4720, 6748, non-BCN graduate.* Designing, developing, estimating, scheduling, contracting, and administering small construction project, including extensive site and feasibility analysis.

BCN 5905: Special Studies in Construction (1-5; max: 12) *Prereq: graduate standing.* For students requiring supplemental work in the building construction area.

BCN 5949: Graduate Construction Management Internship(1-3; max: 6) *Prereq: approval of graduate coordinator.* Two-term employment in construction management position. S/U.

BCN 5957: Advanced International Studies in Construction (1-4; max: 6) *Prereq: graduate standing or supervising instructor's approval; admission to approved study abroad program.* Issues of local construction techniques, construction marketing, international construction, sustainability, global economics, and influence on construction of local culture, traditions, architecture, history, and political climate. S/U.

BCN 6036: Research Methods in Construction (3) *Prereq: graduate standing.* Research proposal development process and statistical, computational, visualization, and presentation tools available to researcher.

BCN 6580: High-Performance Green Building Delivery Systems (3) *Prereq: graduate standing, BCN 6585/ICM6680, or consent of instructor.* High-performance green buildings; emerging delivery systems, evaluating their sustainability, and details on LEED criteria.

BCN 6585: Sustainable Construction (3) *Prereq: graduate standing.* Sustainability principles applied to planning, design, operation, renovation, and deconstruction of built environment. Emphasis on resource efficiency, environmental protection, and waste minimization.

BCN 6586: Construction Ecology and Metabolism (3) *Prereq: graduate standing.* Sustainability principles and concepts related to reducing environmental impacts of creating, operating, and deconstruction built environment.

BCN 6621: Bidding Strategy (3) *Prereq: BCN 3700/6748C, 4612C/5618C, graduate standing.* Strategy of contracting to maximize profit through overhead distribution, breakeven analysis, probability and statistical technique, a realistic risk and uncertainty objective, and bid analysis both in theory and in practice.

BCN 6641: Construction Value Engineering (3) *Prereq: BCN 4612C/5618C, graduate standing.* Principles and applications of value engineering in construction industry.

BCN 6748: Construction Law (3) *Prereq: graduate standing.* Formation of a company, licensing, bid process, contracts, plans and

specifications, mechanics liens, insurance bonds, and remedies as they relate to the building constructor and construction manager. Case studies.

BCN 6755: Construction Financial Management (3) *Prereq: ACG 2021C, graduate standing.* Financial management of construction company using and analyzing income statements and balance sheets, budgeting, cash flow, and cost reporting systems.

BCN 6756: Housing Economics and Policy (3) *Prereq: graduate standing.* Concepts, terminology, and issues in affordable housing.

BCN 6771: Construction Work Acquisition (3) *Prereq: BCN 5618C, MAR 3023, and graduate standing.* Importance of successful strategy to remain competitive in industry. Marketing strategy developed for commercial construction company in private sector.

BCN 6777: Construction Management Processes (3) *Prereq: graduate standing.* Existing and emerging systems for designing, planning, and construction of projects. Changing roles, relationships, and responsibilities of the parties involved.

BCN 6787: Construction Information Systems (3) *Prereq: CGS 2531 or equivalent, graduate standing.* Potential applications of computer and information systems in construction industry.

BCN 6905: Directed Independent Study in Construction (1-3; max: 3) *Prereq: graduate standing.*

BCN 6910: Supervised Research (1-3; max: 3) *Prereq: graduate standing.* S/U.

BCN 6933: Advanced Construction Management (1-5; max: 12) *Prereq: graduate standing.* Financial and technological changes affecting construction and the management of construction projects. H.

BCN 6934: Construction Research (1-6; max: 12) *Prereq: graduate standing.* Research for master's report option. S/U.

BCN 6940: Supervised Teaching (1-3; max: 3) *Prereq: graduate standing.* S/U.

BCN 6971: Research for Master's Thesis (1-15) *Prereq: graduate standing.* S/U.

DCP 6931: Special Topics in Design, Construction, and Planning(1-4; max: 6)

DCP 7790: Doctoral Core I (3) Philosophy, theory, and history of inquiry into the processes of design, urban development, and building systems.

DCP 7792: Doctoral Core II (3) *Prereq: DCP 7790.* Urban, environmental, and legal systems in the context of urban development.

DCP 7794: Doctoral Seminar (1; max: 4) *Coreq: DCP 7911; for entering Ph.D. students.* Successfully negotiating graduate school and writing a dissertation.

DCP 7911: Advanced Design, Construction, and Planning Research I (3) *Prereq: STA 6167. Coreq: DCP 7794; for entering Ph.D. students.* Survey and critical analysis of research in the disciplines of design, construction, and planning. Emphasizes theory and methods.

DCP 7912: Advanced Design, Construction, and Planning

Research II (3) *Prereq: DCP 7911.* Conducting advanced research in architecture, design, landscape, planning, and construction.
DCP 7940: Supervised Teaching (1-5; max: 5) *Prereq: not open to students who have taken 6940.* Independent student teaching under the supervision of a faculty member. S/U.
DCP 7949: Professional Internship (1-5; max: 5) Professional faculty-supervised practicum.
DCP 7979: Advanced Research(1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
DCP 7980: Research for Doctoral Dissertation (1-15) S/U.
ICM 5904: Special Studies (1-3; max: 12)
ICM 6420: Commercial Management and Cost Control (3) *Prereq: graduate standing.* Budgeting and estimating, and principles of cost analysis for international projects.
ICM 6440: Construction Value Management (3) *Prereq: graduate standing.* Classical value management/value engineering principles; practical applications for designers, contractors, suppliers, and other construction functions. Students conduct full-scale VM/VE studies of recent international projects.
ICM 6680: Principles of International Sustainable Construction (3) *Prereq: graduate standing.* Techniques for creating good indoor and outdoor environments, renewable resources, conservation, low environmental impact methods, life cycle assessments.
ICM 6682: Construction Ecology and Metabolism(3) *Prereq: graduate standing.* Application of ecological theory and developments in industrial ecology to ecological design in built environment.
ICM 6684: High-Performance Green Building Delivery Systems (3) *Prereq: graduate standing, BCN 6585 or ICM 6680, or consent of instructor.* Overview of emerging delivery systems for high-performance green buildings and the basis on which their sustainability can be evaluated. LEED criteria are discussed in detail.
ICM 6710: Construction Human Resource Management (3) *Prereq: graduate standing.* Theories of human behavior and influence and leadership, organization, environment, motivation, and culture.
ICM 6750: Managing Construction Information Technology (3) *Prereq: graduate standing.* Applications of computer and information systems in international construction industry. How information technology develops and how it dramatically affects structure, process, and performance of projects.
ICM 6751: International Construction Management (3) *Prereq: graduate standing.* Principles of overseas marketing and business development. International contract documents and management and performance aspects of international construction projects.
ICM 6752: Construction Finance and Investment (3) *Prereq: graduate standing.* Aspects of project finance, from funding sources to financial engineering as well as managerial economics and

accounting relevant to effect project management.

ICM 6761: Advanced Planning, Scheduling, and Logistics (3) *Prereq: graduate standing.* Overall schedule, including overall durations and phasing and review points, principles of logistics planning, and practicalities of detailed network scheduling.

ICM 6762: Construction Risk Management (3) *Prereq: graduate standing.* Overview of what is meant by risk and uncertainty and influences in international construction industry.

ICM 6770: Advanced Project Safety Management (3) *Prereq: graduate standing.* International, governmental, and construction industry requirements of safety and loss control regulations. Project responsibilities.

ICM 6772: International Strategic Management (3) *Prereq: graduate standing.* Performance measurements and evaluation processes. Students assess international business opportunities, formulate business strategy, and learn how project strategy should be developed to best advantage of firm.

ICM 6905: Directed Independent Study in International Construction (1-3; max: 3)

ICM 6910: Supervised Research (1-3; max: 3) S/U.

ICM 6930: Construction Communication and Research (3) *Prereq: graduate standing.* Research proposal development process and statistical, computational, visual, and presentational tools available to researcher.

ICM 6934: International Construction Research (1-6; max: 12) S/U.

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Business Administration--General

Warrington College of Business Administration

Graduate Faculty

Graduate degrees offered by the Warrington College of Business Administration are the Doctor of Philosophy with major programs in business administration and in economics; the Master of Arts with major programs in economics, in business administration (with concentrations in insurance and marketing), and in international business; the Master of Science with major programs in Information Systems and Operations Management (with a concentration in supply chain management), in entrepreneurship, in finance, in management, in real estate, and in business administration (with concentrations in insurance and retail); the Master of Business Administration; and the Master of Accounting. Fields of concentration and requirements for the M.B.A. are given under *Requirements for Master's Degrees* of this catalog. Admission and degree requirements for the Ph.D., M.A., and M.S. degrees can be found in the *General Information* section.

Master of Arts: The M.A. degree with a major in international business is designed to provide students with quantitative and application skills to be used in an international business setting. The program provides practical training with a brief study trip to a major international city, where students are required to participate actively in business tours and lectures. The students also have the opportunity to gain credits for the degree by studying at one or more foreign universities for a period of 2 weeks to 8 months.

Master of Science: The M.S. degree with a major in management

targets students from nonbusiness backgrounds who would like to gain "core" business knowledge and application skills. Requirements span the traditional business disciplines to produce a sound knowledge base for students seeking a solid business foundation. Students are required to take such courses as accounting, finance, economics, entrepreneurship, management, marketing, organizational behavior, and statistics. Typical positions for graduates include managers, consultants, and analysts.

Doctor of Philosophy: For the Ph.D. in business administration, students must have a concentration in one of the following:

--Accounting
--Decision and information sciences
--Finance
--Insurance
--Management
--Marketing
--Real estate and urban analysis.

Specific requirements for the various departments and specialties are given in the *Fields of Instruction* in this catalog. (For example, requirements for the Ph.D. degree in economics are given in the *Economics* section of the catalog.) All candidates for the Ph.D. in business administration must satisfy the following general requirements:

Breadth requirement: All applicants for Ph.D. in the business administration program are expected to have completed prior business-related course work at either the advanced undergraduate or graduate level. Students entering without prior work are required to take a minimum of three graduate courses in at least two fields other than their chosen area of concentration. Most often, the appropriate courses will be found in the M.B.A. first-year core; the particular courses to be taken by a student will be decided in consultation with the student's academic adviser. After a student enters the Ph.D. program, the courses taken to satisfy the breadth requirement must be taken in the College of Business Administration.

Research foundations requirement: All students must complete a six-course research skills sequence that prepares them for scholarly research in their chosen area of concentration. Research foundations are defined as essential methodological tools (e.g., statistics, quantitative analysis) and/or substantive content domains (e.g., psychology, economics) outside the student's major field that are considered essential to conducting high quality research in the chosen field. The specific research skills required by each area of concentration can be found in the field descriptions in this Catalog.

Other requirements include satisfactory completion of graduate

course work in the major field of concentration, as well as one or two minor fields designed to add depth to the student's research training. Minors are selected by the student in consultation with his or her advisory committee, and may be within or outside the College of Business Administration. Other requirements for the Ph.D. are given in the *General Information* section of this catalog.

GEB 5212: Professional Writing in Business (1-3; max: 6) Written structure of memoranda, executive summaries, mission statements, marketing and SWOT analyses, product and management structure descriptions, marketing and business plans. Conventions and psychological principles governing reader preferences and assumptions.
GEB 5215: Professional Communication in Business (1-3; max: 6) Balance between descriptive information and application of organizational communication theories and techniques for business and professional speaking.
GEB 5216: Professional Communication (1-2; max: 2) Concepts and strategies needed to develop professional oral communication skills in business. Individual and team presentations. S/U.
GEB 5217: Executive Communication(1-2; max: 2) Guidelines to help build confidence as presenters and to make workplace presentations more effective. S/U.
GEB 5225: Advanced Business Writing (1) *Prereq: GEB 5212.* Advanced writing techniques focusing on interdependence between corporate strategy and communications.
GEB 5929: Foundations Review (1-3; max: 3) Overview of M.B.A. core courses to be used in working professional programs. S/U.
GEB 6365: International Business (3) *Prereq: designed for M.B.A. students.* Explores major characteristics, motivations, interactions, and structural realities of international economics via functional areas of business. Development of multinational framework for effective and efficient firm operation.
GEB 6368: Globalization and the Business Environment (2) Political and economic relations in connection with the structural power sources that directly and indirectly affect the design and shape of global political economy.
GEB 6905: Individual Work (1-4; max: 8) *Prereq: consent of Associate Dean or M.B.A. Director.* Reading and/or research in business administration.
GEB 6928: Professional Development Module IV (1; max: 2) *Prereq: designed for M.B.A. students.* Personal financial planning. S/U.
GEB 6930: Special Topics (1-3; max: 12) *Prereq: consent of instructor.* Topics not offered in other courses and of special current significance.
GEB 6941: Internship (1-4; max: 6) *Open only to graduate students in business administration. May not be used to meet credit requirements in M.B.A. program.* Applied course work. Several papers and reports. S/U.

GEB 6957: International Studies in Business (1-4; max: 12)
Prereq: admission to approved study abroad program and permission of department. S/U.

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Chemical Engineering

College of Engineering

Graduate Faculty

Chair: R. Dickinson. *Graduate Coordinator:* A. Chauhan. *Complete faculty listing by department*: Follow this link

The Ph.D., M.E., and M.S. degrees in chemical engineering require course work in three core areas:

--*The chemical engineering basis* area, consisting of three core courses in the mathematical, the molecular, and the continuum bases of chemical engineering

--*The chemical engineering science and systems* area, consisting of a selection of courses in such areas as transport phenomena, electrochemical engineering, thermodynamics, kinetics, reaction engineering, process control, separation processes, and heat and mass transfer

--*The research specialty* area, consisting of courses designed to build depth in a field of specialization. Courses may be from other academic units, or may be chemical engineering courses such as colloid science, corrosion, polymer science, advanced materials, and biochemical engineering.

BME 6221: Biomolecular Cell Mechanics(3) Biomolecular basis of cell mechanics and cell motility, emphasizing quantitative models and systems-biology approaches.
BME 6322: Dynamics of Cellular Processes (3) *Prereq: a course on kinetics and/or transport, or consent of instructor.* Develops

research skills, including generation of questions, hypotheses testing, reporting, interpretation, and discussion of findings.

ECH 5708: Disinfection, Sterilization, and Preservation (2) Describes problems and the need for these treatments; causative agents and their nature; nature and the use of chemical and physical antimicrobial agents; specific problems and solutions.

ECH 5938: Topics in Colloid Science (3) *Prereq: PHY 2049 and 2056L, CHM 2046 and 2046L, MAC 2312 or equivalent.* Colloids and interfacial phenomena, colloid interaction forces, electrokinetic phenomena, transport phenomena influenced by colloidal forces, and electrokinetic phenomena. Examples and applications.

ECH 6126: Thermodynamics of Reaction and Phase Equilibria (3) Methods of treating chemical and phase equilibria in multi-component systems through application of thermodynamics and molecular theory.

ECH 6270: Continuum Basis of Chemical Engineering (3) Integrated introduction to transport processes in continuous media with emphasis on fluid mechanics and heat and mass transfer.

ECH 6272: Molecular Basis of Chemical Engineering (3) Statistical mechanics and microscopic explanation of macroscopic laws of classical thermodynamics, transport phenomena, and chemical kinetics. Statistical mechanical theories that connect molecular structure to macroscopic properties.

ECH 6285: Transport Phenomena (1-3; max: 3) *Prereq: ECH 6270.*

ECH 6326: Computer Control of Processes (3) Introduction to digital computers, sampled data systems and Z-transforms, control of multiple input-multiple output systems, optimal control, state estimation and filtering, and self-tuning regulators.

ECH 6506: Chemical Engineering Kinetics (3) Fundamental aspects of chemical reactors, including collision theory, transition rate theory, unimolecular rate theory, homogeneous gas and liquid phase kinetics, and heterogeneous kinetics.

ECH 6526: Reactor Design and Optimization (3) Fundamentals of heterogeneous reactor design including the characterization of catalytic reactions and support, the development of global rate of the intrinsic reaction affected by chemical and physical deactivation of catalyst, intraphase and interphase mass and heat transfer, and the design and optimization of various types of heterogeneous reactors.

ECH 6644: Pharmacokinetics(3) Basic pharmacokinetic and pharmacodynamic concepts and models. Use of these concepts in the drug discovery process.

ECH 6709: Electrochemical Engineering Fundamentals and Design (3) Fundamentals of electrodics and ionics applied to systems of interest in electrochemical engineering.

ECH 6726: Interfacial Phenomena I (2) Air-liquid and liquid-liquid interfaces; surface-active molecules, adsorption at interfaces, foams, micro- and macro-emulsions, retardation of evaporation and damping of waves by films, surface chemistry of biological systems.

ECH 6727: Interfacial Phenomena II (2) *Prereq: CHM 2046 and*

2046L. Solid-gas, solid-liquid, solid-solid interfaces. Adsorption of gases and surface-active molecules on metal surfaces, contact angle and spreading of liquids, wetting and dewetting, lubrication, biolubrication, flotation, adhesion, biological applications of surfaces.

ECH 6843: Experimental Basis of Chemical Engineering (3) Statistical design of experiments and treatment of data including regression analysis, interpolation, and integration. Introduction to analytical techniques including electron and photon spectroscopes, chromatography, and mass spectrometry.

ECH 6847: Mathematical Basis of Chemical Engineering (3) Methods of linear systems, chemical engineering applications in finite and infinite dimensional spaces, concepts of stability, application to transport phenomena.

ECH 6851: Impedance Spectroscopy (3) *Prereq: familiarity with applications of differential equations.* Intended for chemists, physicists, materials scientists, and engineers with an interest in applying electrochemical impedance techniques to study a broad variety of electrochemical processes.

ECH 6905: Individual Work (1-6; max: 12) Individual engineering projects suitable for a nonthesis Master of Engineering degree.

ECH 6910: Supervised Research (1-5; max: 5) S/U.

ECH 6926: Graduate Seminar (1; max: 10)

ECH 6937: Topics in Chemical Engineering I (1-4; max: 9) Separations processes, reactor design, applied molecular and kinetic theory, thermodynamics, particulate systems. Properties of chemical substances, transport phenomena, non-Newtonian fluid dynamics, turbulence, applied mathematics, computer science, biochemical and electrochemical engineering.

ECH 6939: Topics in Chemical Engineering III (1-4; max: 9)

ECH 6940: Supervised Teaching (1-5; max: 5) S/U.

ECH 6969: Research Proposal Preparation (1-2; max: 4) H.

ECH 6971: Research for Master's Thesis (1-15) S/U.

ECH 7938: Advanced Special Chemical Engineering Topics for Doctoral Candidates (1-4; max: 8)

ECH 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

ECH 7980: Research for Doctoral Dissertation (1-15) S/U.

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Chemistry

College of Liberal Arts and Sciences

Graduate Faculty

Chair: D. R. Talham. *Graduate Coordinator:* B. W. Smith. *Complete faculty listing by department*: Follow this link

The department offers the Master of Science (thesis or nonthesis) and Doctor of Philosophy degrees with a major in chemistry and specialization in biochemistry, analytical, organic, inorganic, or physical chemistry. The nonthesis degree Master of Science in Teaching is also offered with a major in chemistry. New graduate students should have adequate undergraduate training in inorganic, analytical, organic, and physical chemistry. Normally this will include as a minimum a year of general chemistry, one semester of quantitative analysis, one year of organic chemistry, one year of physical chemistry, and one semester of advanced inorganic chemistry. Additional courses in instrumental analysis, biochemistry, and advanced physical and organic chemistry are desirable. Deficiencies in any of these areas may be corrected during the first year of graduate study. Such deficiencies are determined by a series of placement tests given prior to registration, and the results of these tests are used in planning the student's program. Doctoral candidates are required to complete at least 9 semester credits of courses specified by the division of the Chemistry Department in which they choose to specialize, as well as at least 9 semester credits of out-of-major-division courses. There are some minor restrictions on courses that may be used to meet this requirement. Additional courses may be required by the student's supervisory committee or major professor.

Ph.D. candidates must serve not less than one year as teaching assistants. This requirement will be waived only when, in the opinion of the department, unusual circumstances justify such action. A chemical physics option is offered for students who will be doing research in areas of physical chemistry which require a strong background in physics. For this option, a student meets the departmental requirements for concentration in physical chemistry, except that only one out-of-major division course is required. In addition, a minimum of 14 credits in 4000 level or higher physics courses or a minimum of 7 such credits in physics and 7 in 4000 level or higher mathematics courses is required. Candidates for the master's degree are required to complete any two core courses. The Master of Science degree in chemistry has both thesis and nonthesis options. The nonthesis degree Master of Science in Teaching is offered with a major in chemistry and requires a written paper of substantial length (30 to 50 pages) on an approved topic pertaining to some phase of chemistry, under the course CHM 6905.

CHM 5224: Basic Principles for Organic Chemistry (3) *Prereq: one year of undergraduate organic chemistry.* A review for those students intending to enroll in the Advanced Organic Sequence CHM 6225, CHM 6226.
CHM 5235: Organic Spectroscopy (3) *Prereq: CHM 2211.* Advanced study of characterization and structure proof of organic compounds by special methods, including IR, UV, NMR, and mass spectrometry.
CHM 5275: The Organic Chemistry of Polymers (2) *Prereq: CHM 2200, 2210, or equivalent.* Classification of polymerization types and mechanisms from a mechanistic organic point of view. The structure of synthetic and natural polymers and polyelectrolytes. Reaction of polymers. Practical synthetic methods of polymer preparation.
CHM 5305: Chemistry of Biological Molecules(3) *Prereq: CHM 2211 and 4412.* Mechanistic organic biochemistry. Emphasis on model systems, enzyme active sites, and physical and organic chemistry of biomacromolecules.
CHM 5413L: Advanced Physical Chemistry Laboratory (2) *Prereq: CHM 4411L.* Techniques used in experimental research; techniques of design and fabrication of scientific apparatus. Advanced experiments involving optical, electronic, and high vacuum equipment.
CHM 5511: Physical Chemistry of Polymers (2) *Prereq: CHM 4411 or equivalent.* Structure, configuration, conformation, and thermodynamics of polymer solutions, gels, and solids. Thermal, mechanical, optical, and rheological properties of plastics and rubbers.
CHM 6153: Electrochemical Processes (3) Principles of electrochemical methods, ionic solutions, and electrochemical kinetics.
CHM 6154: Chemical Separations (3) Theory and practice of modern separation methods with emphasis on gas and liquid chromatographic techniques.

CHM 6155: Spectrochemical Methods (3) Principles of atomic and molecular spectrometric methods; discussion of instrumentation, methodology, applications.

CHM 6158C: Electronics and Instrumentation (1-4; max: 6) Principles of operation of instruments, optimization of instrumental conditions, and interpretation of instrumental data for qualitative and quantitative analysis.

CHM 6159: Mass Spectrometric Methods (3) Modern spectrometry including fundamentals, instrumentation, and analytical applications.

CHM 6165: Chemometrics (3) *Prereq: graduate standing.* Analytical method, information theory, and chemometrics, including statistical data analysis, heuristic and non-heuristic data analysis (pattern recognition and artificial intelligence), and experimental design and optimization.

CHM 6180: Special Topics in Analytical Chemistry (1-3; max: 9) *Prereq: two courses of graduate level analytical chemistry.* Lectures or conferences covering selected topics of current interest in analytical chemistry.

CHM 6190: Analytical Chemistry Seminar (1; max: 20) *Attendance required of graduate majors in the analytical area. graduate course in analytical chemistry.* Presentation of one seminar. S/U option.

CHM 6225: Advanced Principles of Organic Chemistry (4) *Prereq: CHM 2211.* Principles of organic chemistry and their application to reaction mechanisms.

CHM 6226: Advanced Synthetic Organic Chemistry (3) *Prereq: CHM 6225.* Discussion and application of synthetic methodology.

CHM 6227: Topics in Synthetic Organic Chemistry (2) *Prereq: CHM 6226.* Synthesis of complex organic molecules, with emphasis on recent developments in approaches and methods.

CHM 6251: Organometallic Compounds (3) Properties of organometallic compounds, the nature of the carbon-metal bond, compounds of metals in groups 1, 2, 3, and 4, and transition metals.

CHM 6271: The Chemistry of High Polymers (2) Fundamental polymer chemistry, with emphasis on the mechanisms of polymerization reactions and the relationship of physical properties to chemical constitution.

CHM 6301: Enzyme Mechanisms (3) Principles of enzyme structure; isolation and purification; physical chemistry of enzyme/substrate interactions; general overview of classes; transition state theory and catalysis; types of chemical catalysis; survey of cofactors; example mechanisms; catalytic antibodies; ribozyme structure and catalysis.

CHM 6302: Chemistry and Biology of Nucleic Acids (3) Principles of nucleic acid structure and function; protein/nucleic acid interactions with particular emphasis on transcriptional regulators and DNA and RNA polymerases; chemistry of phosphate hydrolysis and its application to enzyme mechanisms; evolution of novel RNA molecules capable of specific binding and catalysis.

CHM 6303: Methods in Computational Biochemistry and Structural Biology (3) Modeling and protein structures enzyme reaction mechanisms using empirical as well as quantum-mechanical methods.
CHM 6304: Special Topics in Biological Chemistry Mechanisms (3-6; max: 9) Molecular evolution, bioinformatics and protein structure prediction, principles of molecular recognition, rational protein design, biotechnology, reengineered organisms, advanced biophysical techniques, and computational biology.
CHM 6381: Special Topics in Organic Chemistry (1-3; max: 9) *Prereq: CHM 6225, 6226.* Chemistry of selected types of organic compounds, such as alkaloids, carbohydrates, natural products, steroids.
CHM 6390: Organic Chemistry Seminar Presentation(1; max: 20) *Attendance required of graduate majors in the organic area.* Presentation of one seminar.
CHM 6391: Organic Chemistry Seminar Discussion(1; max: 10) *Prereq: graduate standing.* Attendance at weekly seminars reporting current advances in organic chemistry. S/U.
CHM 6430: Chemical Thermodynamics (3) Energetics, properties of ideal and nonideal systems primarily from the standpoint of classical thermodynamics.
CHM 6461: Statistical Thermodynamics (3) *Prereq: CHM 6430.* Fundamental principles with applications to systems of chemical interest.
CHM 6470: Chemical Bonding and Spectra I (3) Basic methods and applications of quantum chemistry; atomic structure; chemical bonding in diatomic and polyatomic molecules. Brief introduction to molecular spectroscopy.
CHM 6471: Chemical Bonding and Spectra II (3) *Prereq: CHM 6470.* Theory of symmetry and its chemical applications; semi-empirical molecular orbital treatment of simple inorganic and organic molecules; further applications to inorganic and organic chemistry.
CHM 6480: Elements of Quantum Chemistry (3) *Prereq: CHM 6471.* Brief treatment of the Schrodinger equation, followed by a survey of applications to chemical problems.
CHM 6490: Theory of Molecular Spectroscopy (3) *Coreq: CHM 6471.* Molecular energy levels, spectroscopic selection rules; rotational, vibrational, electronic, and magnetic resonance spectra of diatomic and polyatomic molecules.
CHM 6520: Chemical Physics (3) *Prereq: CHM 6470 or consent of instructor. Identical to PHZ 6247.* Topics from the following: intermolecular forces; molecular dynamics; electromagnetic properties of molecular systems; solid surfaces; theoretical and computational methods.
CHM 6580: Special Topics in Physical Chemistry (1-3; max: 12) Lecture or conferences covering selected topics of current interest in physical chemistry.
CHM 6586: Computational Chemistry(3) *Prereq: undergraduate physical chemistry.* Software for computational chemistry; model

building and molecular mechanics; molecular orbitals and electronic structure; optical, infrared, and magnetic resonance spectra; solvation effects and molecular dynamics; building large systems.

CHM 6590: Physical Chemistry Seminar (1; max: 20) *Attendance required of graduate majors in physical chemistry. graduate course in physical chemistry.* Presentation of one seminar. S/U.

CHM 6620: Advanced Inorganic Chemistry I (3) Crystalline state; covalent bonding; acids, bases, and solvents, nonmetallic compounds of Groups II through VII with emphasis on structure and reactivity.

CHM 6621: Advanced Inorganic Chemistry II (3) *Prereq: CHM 6620.* Electronic structure of metals and transition metal complexes; solution chemistry and reaction mechanisms at metal centers; redox reactions; introduction to organometallic and bioinorganic chemistry.

CHM 6626: Applications of Physical Methods in Inorganic Chemistry (3) *Prereq: graduate standing or consent of instructor.* Principles and applications of spectroscopic methods to the solution of inorganic problems. Those techniques used most extensively in current inorganic research are treated.

CHM 6628: Chemistry of Solid Materials (3) Structure and properties of solids; semiconductors and superconductors.

CHM 6670: Inorganic Biochemistry (3) *Prereq: graduate standing or consent of instructor.* Role of elements in biology. Modern spectroscopic and physical methods for study of Group I and II metals, metalloenzymes, metal ion transport and storage, functions of nonmetals in biochemical systems, and biomedical/biotechnical applications of metals.

CHM 6680: Special Topics in Inorganic Chemistry (1-3; max: 12) Lectures or conferences on selected topics of current research interest in inorganic chemistry.

CHM 6690: Inorganic Chemistry Seminar (1; max: 20) *Attendance required of graduate majors in inorganic chemistry. graduate course in inorganic chemistry.* Presentation of one seminar. S/U option.

CHM 6720: Chemical Dynamics (3) Basic concepts of rate laws, collision theory, and transition state theory; an introduction to reaction dynamics, structural dynamics, and quantitative structure-reactivity correlations.

CHM 6905: Individual Problems, Advanced (1-5; max: 10) *Prereq: consent of faculty member supervising the work.* Double registration permitted. Assigned reading program or development of assigned experimental problem. S/U option.

CHM 6910: Supervised Research (1-5; max: 5) S/U.

CHM 6934: Advanced Topics in Chemistry (1; max: 8) *Prereq: consent of instructor.* Discussion and evaluation of chemical research advances reported in current chemical literature. S/U

CHM 6935: Chemistry Colloquium (1; max: 7) Topics presented by visiting scientists and local staff members. S/U.

CHM 6943: Internship in College Teaching (2, 4, 6; max: 6) *Prereq: graduate standing.* Required for Master of Science in

Teaching students but available for students needing additional practice and direction in college-level teaching.

CHM 6971: Research for Master's Thesis (1-15) S/U.

CHM 7485: Special Topics in Theory of Atomic and Molecular Structure (1-3; max: 9) *Prereq: PHZ 6426 or equivalent.* Mathematical techniques used in atomic, molecular, and solid-state theory. The one-electron approximation and the general quantum-mechanical manybody problems. Selected advanced topics.

CHM 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

CHM 7980: Research for Doctoral Dissertation (1-15) S/U.

CHS 5110L: Radiochemistry Laboratory (3) *Prereq: CHM 3120 and 3400 or 4412, or consent of instructor.* Radioactivity detection, radiochemical separations and analyses, radiochemistry laboratory techniques, the practice of radiological safety, and tracer applications of radioisotopes in chemistry and other fields.

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Civil and Coastal Engineering

College of Engineering

Graduate Faculty

Interim Chair: K. Hatfield. *Graduate Coordinator:* M. Tia. *Complete faculty listing by department*: Follow this link

The Department offers two distinct graduate programs: civil engineering and coastal and oceanographic engineering. The civil engineering program is offered with the following degrees: Master of Engineering, Master of Science, and Doctor of Philosophy. The master's degree in civil engineering is also offered through the Electronic Delivery of Graduate Engineering (EDGE) program, which is a distance learning program delivered either via streaming video or DVD directly to the students. The coastal and oceanographic engineering program is offered with the following degrees: Master of Engineering, Master of Science, and Doctor of Philosophy degree. All degree programs include areas of specialization in construction, civil engineering management, geotechnical engineering, water resources and hydrology, public works, structural engineering, civil engineering materials, geosensing systems engineering, coastal engineering, oceanographic engineering and offshore structures, and transportation engineering. All degrees except the Ph.D. are available in a thesis or nonthesis option. The nonthesis option has two formats: report and 30-hour non-report. Students who elect the nonthesis report must successfully complete a document of substantial engineering content for a minimum of two hours credit in CGN 6974 for civil engineering majors, or EOC 6905 for coastal and oceanographic engineering majors. Minor or supporting work is encouraged from a variety of related or allied fields of study.

Ph.D. students are required to take a preliminary examination. Requirements for the M.S., M.E., and Ph.D. degrees are given in the *General Information* section of this catalog.

Subject to approval by the supervisory committee, graduate-level courses taken through the Departments of Environmental Engineering Sciences, Geological Sciences, and Mechanical and Aerospace Engineering are considered as major credit.

For courses taken through the Department of Civil and Coastal Engineering, credit hours graded S/U will not count toward graduation except for:

--6 hours of CGN or EOC 6971 for thesis students
--3 hours of CGN 6974 for students working on the M.E. report
--CGN or EOC 7979
--CGN or EOC 7980

CWR 6126: Variable-Density Groundwater Flow (3) *Prereq: CWR 5125 Groundwater Flow 1 or consent of instructor.* Numerical groundwater modeling, including groundwater flow, contaminant transport, and variable-density flow and transport equations and finite-difference approximations.

Civil Engineering

CCE 5035: Construction Planning and Scheduling (3) *Prereq: CCE 4204.* Planning, scheduling, organizing, and control of civil engineering projects with CPM and PERT. Application of optimization techniques.
CCE 5405: Construction Equipment and Procedures (3) *Prereq: CCE 4204 or consent of instructor.* Design and optimization of equipment systems for heavy construction.
CCE 6037: Civil Engineering Operations I (2) *Prereq: graduate status.* Advanced construction engineering and management procedures at the project level to support quantitative decision making.
CCE 6038: Innovative Construction Techniques (2) *Prereq: CCE 4204 or consent of instructor.* Advanced construction engineering techniques and management coordination procedures for civil engineering projects.
CCE 6505: Computer Applications in Construction Engineering (3) *Prereq: CGS 2425, CCE 5035, or consent of instructor.* Application of computer solutions to construction engineering/civil engineering management problems; microcomputer use.
CCE 6507: Computer Applications in Construction Engineering II (3) *Prereq: CGS 4161, CCE 6505 or consent of instructor.* Applications of advanced computer solutions to construction engineering/civil engineering management problems.

CCE 6516: Topics in Airborne Laser Mapping Technology (3) *Prereq: SUR 6381.* Laser mapping technology, current status of technology, data collection methodologies and requirements, data processing, calibration, errors, conversion to local datums, data base management, filtering techniques and bare earth DTM, product generation and application.

CEG 5105: Geotechnical Engineering (3) *Prereq: consent of instructor.* Shallow foundations, bearing capacity, settlements, deep foundations, pile testing, earth pressures, excavations, retaining structures, dewatering.

CEG 5112: Advanced Geotechnical Aspects of Landfill Design (3) *Prereq: CEG 4012 or consent of instructor.* Settlement analysis, slope stability, liner design, and LCRS design.

CEG 5115: Foundation Design (3) *Prereq: CEG 4012, CES 4702, or consent of instructor.* Investigations, bearing capacity, and the analysis and design of shallow footings, walls, and deep pile foundations.

CEG 5205C: Insitu Measurement of Soil Properties (3) *Prereq: CEG 4012.* Methods of soil exploration; techniques of soil sampling and insitu testing; field performance of insitu testing.

CEG 5206: Geosensing I (3) *Prereq: consent of instructor.* History of geodetic science as applied to earth's shape, local and world reference frames, gravity and anomalies, geoid, satellite geodesy and GPS, geodetic positioning, and navigation by satellite technology.

CEG 5805: Ground Modification Design (2) *Prereq: CEG 4012, CGS 2425.* Introduction to design of ground modification techniques for improvement of marginal construction sites.

CEG 6015: Advanced Soil Mechanics (3) *Prereq: CEG 4011, 4012, or consent of instructor.* Nature and origin of soil. Stresses within a soil body. Stress-strain behavior and shear strength of dry, saturated no flow, saturated transient flow soils.

CEG 6116: Advanced Shallow Foundation Design (3) *Prereq: CEG 6015, CES 4702.* Application of soil mechanics to design and analysis of shallow foundations.

CEG 6117: Advanced Deep Foundation Design (3) *Prereq: CEG 6015.* Application of soil mechanics to design and analysis of deep foundations.

CEG 6201: Experimental Determination of Soil Properties (3) *Prereq: CEG 4012 or consent of instructor.* Advanced laboratory tests, constant rate of strain consolidation, factors influencing stress-deformation response, elastic-plastic constitutive relationships, failure criteria. H.

CEG 6207: Geosensing II (3) *Prereq: CCE 5206.* Introduction to satellite positioning technologies; advancement in global positioning system, reference frames, orbits, and GPS observables; errors and positioning with GPS; static and phase-differenced kinematic GPS for precise aircraft trajectory.

CEG 6405: Seepage and Drainage Problems in Geotechnical Engineering (2) *Prereq: CEG 4011, 4012, or consent of instructor.* Darcy's law, coefficient of permeability, flownets, seepage forces.

Engineering applications-dewatering systems, slope stability, filter design, earth dams, drainage.

CEG 6505: Numerical Methods of Geomechanics (3) *Prereq: CGN 3421, CEG 6015 or consent of instructor.* Application of computer solutions to geotechnical engineering problems.

CEG 6515: Earth Retaining Systems and Slope Stability (3) *Prereq: CEG 6015.* Applications of soil mechanics to design and analysis of earth retaining systems and slope stability.

CES 5010: Probabilistic and Stochastic Methods in Civil Engineering (3) *Prereq: CES 3102 or equivalent.* Fundamental aspects of uncertainty and their roles in determining system reliability. Probability and statistics, stochastic processes, random data analysis, and reliability methods.

CES 5116: Finite Elements in Civil Engineering (3) *Prereq: CES 4141.* Introduction to finite elements, use of finite element concepts for structural analysis. Application of 1-, 2-, and 3-D elements of structural problems.

CES 5325: Design of Highway Bridges (3) *Prereq: CES 4605, 4702.* Analysis by influence lines, slab and girder bridges, composite design, prestressed concrete, continuity, arch bridges, design details, highway specifications.

CES 5606: Topics in Steel Design (3) *Prereq: CES 4605.* Plate girders, torsion, biaxial bending, frame design, composite beams and columns, fatigue, monosymmetric members, and moment connections.

CES 5607: Behavior of Steel Structures (3) *Prereq: CES 4605.* Plastic analysis and designs of beams and frames. Buckling and stability problems. Shear and torsion.

CES 5715: Prestressed Concrete (3) *Prereq: CES 4702.* Analysis and design of prestressed concrete flexural members; pre- and post-tensioned construction, allowable stress, strength evaluation; design for bending moments and shear; evaluation of serviceability requirements; design of simple bridges.

CES 5726: Design of Concrete Systems (3) *Prereq: CES 4141 and 4702.* Strength design of building systems (frames and shear walls), torsion floor systems, biaxial moment in columns, load systems.

CES 5801: Design and Construction in Timber (3) *Prereq: consent of instructor.* Analysis and design of beams, columns, connections, and diaphragm/shearwall structures using sawn timber, laminated timber, and plywood and including a comprehensive design project.

CES 5835: Design of Reinforced Masonry Structures (3) *Prereq: CES 4702.* Properties, specifications, and construction requirements for structures incorporating clay brick, concrete block, and mortar; analysis and design of masonry structures including a comprehensive diaphragm/shearwall masonry structure design project.

CES 6106: Advanced Structural Analysis (3) *Prereq: CES 4605, 4702.* Traditional methods of analyses for forces and deformations; modern matrix methods including the direct stiffness method.

CES 6108: Structural Dynamics (3) *Prereq: EGM 3400, CES 6106.* Evaluating structural response to the effect of dynamic loads for single-degree and multidegree of freedom systems. Considers seismic and wind effects, modal analysis, numerical methods, structural idealization, response spectra, and design codes.

CES 6165: Computer Methods in Structural Engineering (3) *Prereq: CGS 2425, 6106.* Modern program development techniques for structural analysis. Efficiency, databases, modularity, equation solving, and substructure programming concepts.

CES 6551: Design of Folded Plates and Shells (3) *Prereq: CES 4605, 4702.* Bending of systems of plates. Analysis for membrane stresses; pressure vessels, secondary bending stresses. Design of shell systems and folded plates. Design details.

CES 6706: Advanced Reinforced Concrete (3) *Prereq: CES 4704, 5726C.* Torsion in structural members. Ultimate load theories and application to design. Columns and beam columns. Shear walls, combined shear walls and frames. Research topics.

CES 6855: Condition Assessment of Structures (3) Testing techniques for assessing the condition of existing structures. Focuses on material damage and durability.

CGN 5125: Legal Aspects of Civil Engineering (3) Engineer's view of contracts for design and construction. Legislation and policy affecting labor-management relationships in construction.

CGN 5135: Project Optimization Using Value Engineering and TQM (3) Total quality management methods applied to traditional value engineering theory for optimization of engineering projects. Function analysis systems techniques (FAST), constructability, front-end-planning, agreement matrix, life cycle costing, and statistical methods for process control.

CGN 5315: Civil Engineering Systems (3) Civil engineering applications of operations research techniques, models of scheduling, linear programming, queuing theory, and simulation.

CGN 5508: Experimentation and Instrumentation in Civil Engineering Materials Research (3) Fundamentals and applications of testing and measuring systems commonly used; constitutive models, testing methods, instrumentation, and error analysis.

CGN 5605: Public Works Planning (3) Functional approach to planning and implementing public works needs with emphasis on role of engineer.

CGN 5606: Public Works Management (3) Nature of profession, duties, and administrative responsibilities. Organization and management of operating divisions with emphasis on role of engineer.

CGN 6155: Civil Engineering Practice I (3) *Prereq: graduate status.* Advanced construction engineering management skills and procedures in support of design and construction practice at the project level.

CGN 6156: Construction Engineering II (3) *Prereq: CCE 4204 or consent of instructor.* Advanced construction engineering management skills and procedures in support of design and

construction practice above the project level.
CGN 6505: Properties, Design and Control of Concrete (3) *Prereq: CGN 3501.* Portland cement and aggregate properties relating to design, control, and performance of concrete. Concrete forming and construction methods. Laboratory testing and analysis.
CGN 6506: Bituminous Materials (3) *Prereq: TTE 4811.* Analysis of strength and deformation mechanism for asphalt concrete, properties, and their effect on flexible pavement performance. Pavement construction and quality assurance methods, testing and evaluation of asphalts and mixture.
CGN 6905: Special Problems in Civil Engineering (1-6; max: 10) Studies in areas not covered by other graduate courses.
CGN 6910: Supervised Research (1-5; max: 5) Credits do not apply to any graduate degree. S/U.
CGN 6936: Civil Engineering Graduate Seminar (1; max: 6) Lectures by graduate students, faculty members, and invited speakers. S/U.
CGN 6940: Supervised Teaching (1-5; max: 5) Credits do not apply to any graduate degree. S/U.
CGN 6971: Research for Master's Thesis (1-15) S/U.
CGN 6972: Research for Engineer's Thesis (1-15) S/U.
CGN 6974: Master of Engineering or Engineer Degree Report (1-6; max: 6) Individual work culminating in a professional practice-oriented report suitable for the requirements of the Master of Engineering or Engineer degree. Three credits only are applicable toward the requirements of each degree. S/U.
CGN 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
CGN 7980: Research for Doctoral Dissertation (1-15) S/U.
CWR 5125: Groundwater Flow I (3) *Prereq: CWR 4202 or consent of instructor.* Porous media flow. Darcy's law. Conservation of mass. Laplace equation. Flownets. Well hydraulics.
CWR 5127: Evaluation of Groundwater Quality (3) *Prereq: CWR 5125 or 6525, or consent of instructor.* Characteristics of flow in saturated and unsaturated zones; solute convection and dispersion; effects of chemical reactions and adsorption; management of groundwater quality.
CWR 5235: Open Channel Hydraulics (3) *Prereq: CWR 4202 or consent of instructor.* Classification of flow, Normal depth. Specific energy and critical depth. Gradually varied flow. Transitions.
CWR 6115: Surface Hydrology (3) *Prereq: MAP 2302, CWR 3201, or EGN 3353C.* Occurrence and distribution of water by natural processes including atmospheric thermodynamics, precipitation, runoff, infiltration, water losses, flood routing and catchment characteristics, analysis, and methods of runoff prediction. Current hydrologic computer models.
CWR 6236: Sediment Transport I (3) *Prereq: CWR 5235 or consent of instructor.* Introduction to movable bed models.

Sediment properties. Scour initiation. Influence of slope. Stable channels. Bed forms. Transport as bed load and suspended transport.

CWR 6255: Diffusive and Dispersive Transport (3) *Prereq: CWR 4202 or consent of instructor.* Introduction to diffusive and dispersive transport processes in flowing water. Fick's law. Available analytical and numerical models.

CWR 6525: Groundwater Flow II (3) *Prereq: CWR 5125 or consent of instructor.* Analytical and computer modeling of groundwater flow problems by means of finite difference, finite element, and boundary element methods.

CWR 6537: Contaminant Subsurface Hydrology (3) *Prereq: MAP 2302 or 4341 or equivalent; CGS 2420 or equivalent; SWS 4602C or ABE 6252 or CWR 5125 or 5127 or equivalent; or EES 6208 or equivalent.* Physical-chemical-biological concepts and modeling of retention and transport of water and solutes in unsaturated and saturated media. Applications of environmental aspects of soil and groundwater contamination.

TTE 5006: Advanced Urban Transportation Planning (3) *Prereq: graduate standing and consent of instructor.* Analytical techniques for estimating future travel demands; and for for planning transportation facilities and locations. Review of transportation technology and future systems.

TTE 5256: Traffic Engineering (3) Traffic characteristics, studies and analyses, street operations, level of service analysis, congestion and access management, signs and markings, pedestrians, bicycles, parking, roadway lighting.

TTE 5305: Advanced Transportation Systems Analysis (3) *Prereq: TTE 4004.* Systems analysis in transportation planning and engineering, including supply, demand, equilibrium, evaluation, and decision analysis.

TTE 5805: Geometric Design of Transportation Facilities (3) *Prereq: TTE 4004 or consent of instructor.* Geometric design criteria and controls of highways and intersections.

TTE 5835: Pavement Design (2) *Prereq: TTE 4811 or consent of instructor.* Design of flexible and concrete pavements.

TTE 5837: Pavement Management Systems (3) *Prereq: TTE 5835.* Evaluation, analysis, design, performance prediction, planning, and maintenance of pavements.

TTE 6205: Freeway Operations and Simulation (3) *Prereq: consent of instructor.* Uninterrupted traffic flow theory. Highway capacity analysis. Microscopic simulation. Freeway management and control methods.

TTE 6259: Urban Streets Simulation and Control (3) *Prereq: TTE 4201/5256.* Principles of simulation modeling and applications. Simulating urban street operations using commercially available packages; traffic signal control and optimization for urban streets; signal control hardware.

TTE 6267: Traffic Flow Theory (3) *Prereq: TTE 4201/5256.* Vehicle-roadway-infrastructure interactions, equations of motion, and car-following; microscopic and macroscopic traffic

characteristics and traffic stream models; simulation, queueing theory, and shockwave analysis.

TTE 6306: Computational Methods in Transportation Engineering(3) *Coreq: TTE 5256.* Applying numeric methods to traffic engineering/analysis. Key issues in implementing a computational methodology into a software format. Fundamentals of developing simulation software.

TTE 6315: Highway Safety Analysis (3) Statistics and characteristics of accidents, accident reconstruction, accident causation and reduction.

TTE 6505: Discrete Choice Analysis (3) *Prereq: consent of instructor.* Theory and models of individual choice behavior, unordered and ordered multinomial choice models, empirical specifications, maximum likelihood estimation, state-of-the-art methods, travel modeling applications.

TTE 6606: Urban Transportation Models (3) *Prereq: TTE 5305 or consent of instructor.* Mathematical models for decision making in planning and operations of urban highway and transit systems.

Coastal and Oceanographic Engineering

EGM 5816: Intermediate Fluid Dynamics (3) *Prereq: EGN 3353C (or CWR 3201), MAP 2302.* Basic laws of fluid dynamics. Introduction to potential flow, viscous flow, boundary layer theory, and turbulence.

EOC 5860: Port and Harbor Engineering (3) *Prereq: EGN 3353C (or CWR 3201), MAP 2302 or equivalent.* Principles of port design; wave penetration; harbor oscillations; sediment movement and pollutant mixing; port structures, port operations; case studies.

EOC 6196: Littoral Processes (3) *Prereq: OCP 6165.* Shoreline developments; nearshore hydrodynamics; sediment transport phenomena by waves and wind; methods of determining littoral transport quantities; effects of groins, jetties, and other coastal structures on littoral processes.

EOC 6430: Coastal Structures (3) *Prereq: OCP 6165.* Planning and design for beach nourishment, breakwaters, jetties, seawalls and coastal protection structures.

EOC 6850: Numerical Simulation Techniques in Coastal and Ocean Engineering (3) Numerical treatment of problems in ordinary and partial differential equations with application to incompressible geophysical fluid flows.

EOC 6905: Individual Study in Coastal and Oceanographic Engineering (1-4; max: 8)

EOC 6932: Selected Field and Laboratory Problems (3) *Prereq: EGN 3353C (or CWR 3201), MAP 2302 or equivalent.* Field and/or laboratory investigations employing modern research techniques and instrumentation.

EOC 6934: Advanced Topics in Coastal and Oceanographic Engineering (1-6; max: 9) Waves; wave-structure interaction; coastal structures; ocean structures; sediment transport; instrumentation; advanced data analysis techniques; turbulent flow

and its applications.
EOC 6939: Graduate Seminar (1; max: 6) Guest lecturers; lectures by COE faculty and students. S/U.
EOC 6971: Research for Master's Thesis (1-15) S/U.
EOC 6972: Research for Engineer's Thesis (1-15) S/U.
EOC 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
EOC 7980: Research for Doctoral Dissertation (1-15) S/U.
OCP 5293: Coastal Processes (3) *Prereq: EGN 3353C (or CWR 3201), MAP 2302 or equivalent.* Coastal wave and water level fluctuations, littoral transport; tidal inlet dynamics, estuarine hydrodynamics, and sediment transport; techniques of measurements.
OCP 6050: Physical Oceanography (3) *Prereq: MAP 2302, EGN 3353C (or CWR 3201).* Structure of ocean basins; physical and chemical properties of sea water; basic physical laws used in oceanography; ocean current; thermohaline effects; numerical models; heat budget.
OCP 6165: Ocean Waves I: Linear Theory (3) *Prereq: MAP 2302, EGN 3353C (or CWR 3201).* Ocean wave classification, solution of the linearized boundary value problem; simple harmonic waves; shoaling effects; internal waves.
OCP 6165L: Ocean Waves Laboratory (1) Laboratory for linear wave theory. Basic measurement techniques and properties of water waves.
OCP 6167: Ocean Waves II: Nonlinear Theory (3) *Prereq: OCP 6165.* Perturbation development of nonlinear water wave theories; regions of validity of various theories; dynamics and kinematics of nonlinear wave trains composed of single and multiple fundamental components.
OCP 6168: Data Analysis Techniques for Coastal and Ocean Engineers (3) Data editing, fundamentals of spectral analysis, subsurface and surface signal analysis, directional spectral analysis.
OCP 6169: Random Sea Analysis (3) *Prereq: OCP 6165.* Mathematical presentation of random seas; wave spectral analysis, spectral formulations; joint prediction of wave height and period, directionality of random seas, bispectral analysis; principles of hindcasting and forecasting seas.
OCP 6295: Estuarine and Shelf Hydrodynamics I (3) *Prereq: OCP 6050.* Kinematics and dynamics of estuaries, small scale motions, tidal hydrodynamics, nontidal circulations, shelf waves, estuary and shelf interactions, mathematical models.
OCP 6297: Coastal and Estuarine Sediment Transport (3) Sediment properties including size, mineralogy and plasticity, cohesion and flocculation; settling velocity and initiation of motion; coarse and fine sediment transport; wave-sediment interaction; fluid mud rheology and transport; consolidation; sedimentation in estuaries and at coasts.

OCP 6364: Engineering Water Wave Models (3) *Prereq: OCP 6165.* Theory and practical aspects of spectral, diffractive, and Boussinesq water wave models.

OCP 6655: Coastal Sediment Transport Processes (3) *Prereq: CWR 6236, OCP 6165.* Physical sedimentation processes, including boundary layer hydrodynamics, suspended sediment dynamics, and bedload mechanics under wave and current conditions.

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Classics

College of Liberal Arts and Sciences

Graduate Faculty

Chair: R. S. Wagman. *Graduate Coordinator:* A. Wolpert.
Complete faculty listing by department: Follow this link

The department offers the following degrees and programs: the Doctor of Philosophy in classical studies; the Master of Arts degree in classical studies or Latin; the Master of Latin degree, and the Master of Arts in Teaching degree in Latin. Requirements for these degrees are given in the *General Instructions* section of this catalog.

Within the Ph.D. program are three tracks:

--Philology (prepares students for careers in colleges and universities)
--Classical civilization (available via distance course work)
--Latin and Roman studies (available via distance course work).

Requirements for the philology track of the doctoral degree include:

--60 credit hours after the M.A. (or a total of 90 credit hours)

--Five additional seminars after the M.A. in classics at the 500 level or higher

--Three of the following seminars: GRE 6425, GRW 6105, LAT 6425, LNW 6105, and CLA 6805

--A reading knowledge of two modern languages, one of which must

be German

--Reading lists in Greek and Roman authors

--Supervised experience in teaching Latin, Greek, or civilization courses is advised

--Successful completion of a series of qualifying examinations appropriate to the chosen specialization (Greek reading; Latin reading; classical Greek literature in its historical context; classical Latin literature in its historical context; special author/topic)

--An oral preliminary examination, dissertation, and final examination
The M.A. degree in classical studies is recommended for students who plan to continue on to the doctoral level. The M.A. degree in Latin is recommended for students who plan to pursue a career in secondary teaching. Both M.A. programs require 30 credit hours, including 6 credits of GRW or LNW 6971, a thesis, and final examination.

The Master of Latin degree is a non-thesis degree, designed for currently employed and/or certified teaching professionals who wish to widen their knowledge of Latin, broaden their education in the field of classics, and enhance their professional qualifications through a program of summer course work and directed independent study and/or distance learning courses during the regular academic year. The Master of Arts in Teaching, a non-thesis degree, is offered with a program in Latin and is intended for students preparing to teach in community colleges or high schools.

CLA 6125: Augustan Age (3) *Prereq: B.A. in classics.* In-depth investigation of history, political organization, literature, and society of Augustan Rome.
CLA 6515: Roman Dynasty: Nero and the Julio-Claudians (3) *Prereq: B.A. in classics or Latin.* In-depth investigation of the history, political organization, literature, social customs, and architecture of early Imperial Rome (14-68 A.D.).
CLA 6795: Greek and Roman Archeology (3) *Prereq: B.A. in classics or related field.* Grounding in monuments of ancient Greece and Roman, and history and methodology of classical archeology.
CLA 6805: The Classical Research Tradition (3) Research methods in the classics.
CLA 6885: Roman Law and Society (3) Survey of Roman law with special attention to constitutional history and judicial practice in context of conceptual development of civil law (person, property, succession, contract, delict).
CLA 6895: Athenian Law and Society (3) *Prereq: B.A. in classics or related field.* Comprehensive assessment of structures of classical Athens, offering detailed study of Athenian law, constitution, society, gender relations, and culture. Ancient life linked with modern debate

on similar issues.
CLA 6905: Individual Work (2-4; max: 10) Readings and reports in Classical civilization.
CLA 6930: Greece and the Near East (3; max: 9) Rotating topics concerning political, economic, diplomatic, and cultural interaction between Greek world and its neighbors in the East.
CLT 6295: Greek Drama in Translation (3) *Prereq: B.A. in classics or related field.* Readings of plays by Aeschylus, Sophocles, Euripides, and Aristophanes, and discussion of their context and production within fifth-century Athenian society.
GRE 6425: Greek Prose Composition (3) *Prereq: GRD 1131.* Construction of advanced sentences and complex prose in Classical Greek.
GRE 6755: Epigraphy (3; max: 6) *Prereq: reading knowledge of ancient Greek and Latin at advanced level; basic reading knowledge of French and German.* Reading and interpretation of selected inscriptions in Greek and/or Latin.
GRK 6905: Individual Work in Modern Greek (3-5; max: 10) *Prereq: graduate standing or consent of instructor.* Directed independent study.
GRW 6105: The Greek Tradition (3) Synoptic survey of Greek literature.
GRW 6216: Greek Novel (3; max: 6) Selections from ancient Greek novels.
GRW 6316: Greek Tragedy (3; max: 9) *Prereq: advanced reading ability in Greek.* Reading and analysis of Greek tragedies by Aeschylus, Sophocles, or Euripides, whose dramas form cornerstone of western theater. Text selection varies over 3-year cycle.
GRW 6317: Ancient Greek Comedy (3) *Prereq: advanced reading ability in Greek.* Reading and study of ancient Greek comedy, with selected plays by Aristophanes and Menander.
GRW 6345: Greek Lyric Poetry (3; max: 6) Variety and peculiarities of lyric content, style, grammar, structure, dialect, and meter shown through selected poems.
GRW 6346: Pindar (3; max: 6) Selected poems.
GRW 6347: Homer (3; max: 6) Readings from *Iliad* and *Odyssey.*
GRW 6386: Greek Historians (3; max: 6) *Prereq: graduate status or consent of instructor.* Readings and analysis of Herodotus, Thucydides, or other major Greek historians.
GRW 6506: Plato (3; max: 6) Reading of *Symposium* and selected books of the *Republic*.
GRW 6705: Attic Orators (3) *Prereq: graduate student status or consent of instructor.* Examines Attic oratory, focusing on rhetorical methods of persuasion; social dynamics of the disputing process; and political, social, and cultural impact of law on the Athenian democracy.
GRW 6905: Individual Work (2-4; max: 10) *Prereq: graduate standing or consent of instructor.* Readings and reports in Greek language and literature.
GRW 6930: Special Topics in Greek Literature (3; max: 6) *Prereq: graduate status or consent of instructor.* Intensive study of

a particular author, genre, period, or subject.
GRW 6931: Comparative Study of Greek and Latin Literature (3) Study of genre types.
GRW 6971: Research for Master's Thesis (1-15) *Prereq: reading knowledge of ancient Greek at an advanced level.* S/U.
GRW 7979: Advanced Research (3-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
GRW 7980: Research for Doctoral Dissertation (1-15) S/U.
LAT 6425: Latin Prose Composition (3) Translating English into Latin and imitation of various Latin prose styles.
LNW 5325: Roman Elegiac Poetry (3) *Prereq: graduate student status or consent of instructor.* Readings in Latin from one or all of the following: Catullus, Tibullus, Propertius, Ovid, or other Latin elegiac poetry.
LNW 5655: Roman Poets: Horace (3; max: 6) Horace's poetry and metrics.
LNW 5665: Roman Poets: Vergil (3; max: 6) The poetic art of Vergil and its literary, historical, and political background.
LNW 5675: Roman Poets: Ovid (3; max: 6) Ovid's poetic art against its literary, historical, and political background.
LNW 5931: Comparative Study of Latin and Greek Literature (3; max: 6) Study by genre types (content varies).
LNW 6105: The Roman Tradition (3) Synoptic survey of Roman literature.
LNW 6225: The Ancient Roman Novel (3; max: 6) Readings from Petronius and/or Apuleius.
LNW 6335: Roman Oratory and Rhetoric (3; max: 6) Theory and practice of Roman oratory and rhetoric through Latin readings in Cicero, Seneca, and Quintilian, and other sources.
LNW 6365: Studies in Roman Satire (3; max: 6) Readings from Horace, Persius, Petronius, Juvenal, Martial.
LNW 6385: Roman Historians (3; max: 9) Readings from major historians: Sallust, Caesar, Livy, Tacitus, Suetonius, and others.
LNW 6495: Late Latin Literature (3) Readings from one or more of the following: Vulgate, Christian Church Fathers, Historia Apollonii, Peregrinatio Aetheriae, Harrington's Medieval Latin.
LNW 6905: Individual Work (1-4; max: 10) Readings and reports in language and literature.
LNW 6933: Special Topics in Latin Literature (3; max: 6) *Prereq: graduate standing or consent of instructor.* Intensive study of particular author, genre, period, or subject.
LNW 6935: Proseminar in Classics (3) Introduction to the study of classical literature, history of scholarship, bibliographies, areas of the discipline.
LNW 6940: Supervised Teaching (1-5; max: 5) S/U.
LNW 7979: Advanced Research (3-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have

been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

LNW 7980: Research for Doctoral Dissertation (1-15) S/U.

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Clinical and Health Psychology

College of Public Health and Health Professions

Graduate Faculty

Chair: R. M. Bauer. *Graduate Coordinator:* S.R. Boggs. *Complete faculty listing by department*: Follow this link

The Department of Clinical and Health Psychology is a unit of the College of Public Health and Health Professions. The department's programs are its doctoral clinical psychology studies leading to the Ph.D. degree in psychology; an American Psychological Association accredited doctoral internship program; and postdoctoral studies and research. Requirements for the M.S. and Ph.D. degrees are given in the *General Information* section of this catalog.

The clinical psychology doctoral curriculum adheres to the scientist-practitioner model of education and training. Program strengths include research, education, and professional training in health care psychology, with organized areas of concentration in clinical health psychology, clinical child/pediatric psychology, neuropsychology, neurorehabilitation and clinical neuroscience, and emotion neuroscience/psychopathology. Education and training experiences are also available in rural psychology. Interested students can apply for acceptance into the Public Health Program and obtain dual M.P.H./Ph.D. degrees.

Progress in the program is determined by departmental policies which are consistent with American Psychological Association accreditation standards. The curriculum has been continuously accredited by the American Psychological Association since 1953.

Admission to the Department is through appropriate application to the Department's admission committee. A bachelor's degree is generally adequate preparation for graduate admission. It should include undergraduate courses in both experimental psychology and statistics, along with at least three courses from the following psychology areas: developmental, learning, perception, personality, physiological, and social.

CLP 5316: Health Psychology (3) *Prereq: PSY 2013.* Examines relationships among health and behavior in the assessment, treatment, prevention, and rehabilitation of health problems. Review of clinical health psychology with implications for other disciplines.
CLP 5426: Introduction to Neuropsychology (3) *Prereq: PSY 2013, CLP 3144.* Overview of clinical and experimental data on brain-cognition relationships in humans.
CLP 6304: Psychological Foundations of Clinical Psychology I (2-3; max: 3) History and systems of psychology, social psychology, developmental psychology, and cognitive psychology foundations of clinical psychology.
CLP 6307: Human Higher Cortical Functioning (3) Models that explain linkages between brain and behavior. Focus on both functions and dysfunctions.
CLP 6308: Psychological Foundations of Clinical Psychology II (2-3; max: 3) *Prereq: CLP 6304.* Continuation of CLP 6304.
CLP 6309: Psychological Foundations of Clinical Psychology III (2-3; max: 3) *Prereq: CLP 6308.* Continuation of CLP 6308.
CLP 6344C: Lifespan Foundations of Behavioral Health and Illness I (4) *Prereq: admission to CLP.* Theoretical and research foundations of behavioral health and illness using lifespan perspective. Integration of topics of personality, stress and coping, psychopathology, and fundamentals of health psychology.
CLP 6345: Lifespan Foundations of Behavioral Health and Illness II (4) *Prereq: CLP 6344.* Continuation of CLP 6344.
CLP 6375: Introduction to Clinical Psychology(1-3; max: 3) *Prereq: admission to CLP.* Seminar on issues and concepts concurrent with field observation and participation.
CLP 6407: Psychological Treatment I (3) *Prereq: admission to CLP or consent of instructor.* Current dynamic and personality theories, practices, and related research in psychotherapy.
CLP 6417: Psychological Treatment II (3) *Prereq: admission to CLP or consent of instructor.* Current behavioral theories, practices, and related research.
CLP 6425: Seminar in Clinical Neuropsychology (1; max: 6) *Prereq: graduate students only and permission of director.* Basic issues and recent advances. Presentation of research topics, clinical cases, and discussion of professional issues.
CLP 6430: Clinical Psychological Assessment (4) *Prereq: admission to the Clinical Psychology doctoral program.* Introduction to concepts, theory, and practices in clinical psychological assessment across the lifespan.
CLP 6434C: Clinical Psychology Assessment I (4) *Prereq: CLP*

6345. Lifespan approach to assessment with special focus on cognitive functioning.

CLP 6435C: Clinical Psychology Assessment II (4) *Prereq: CLP 6345.* Lifespan approach to assessment with special focus on personality and behavior.

CLP 6446C: Psychological Assessment of Children (3) *Prereq: admission to CLP or consent of instructor.* Developmental, intellectual, visual-motor, achievement, and personality assessment of children.

CLP 6447C: Psychological Assessment of Adults (3) *Prereq: admission to CLP or consent of instructor.* Basic theories, procedures and administration experience in assessment of adult intellect and personality factors.

CLP 6476: Lifespan Psychopathology (4) *Prereq: admission to Clinical Psychology doctoral program.* Diagnostic issues, theoretical formulas, clinical manifestations, and research related to child and adult psychopathology across the lifespan.

CLP 6497: Psychopathological Disturbances (3) *Prereq: admission to CLP or PSY or consent of instructor.* Theories and related research to etiology, clinical description, and diagnosis with implications for treatment.

CLP 6527C: Measurement, Research Design, and Statistical Analysis in Clinical Psychology I (3-4) *Prereq: admission to CLP.* Integration and interaction among research design, tests and measurements, and statistics.

CLP 6528C: Measurement, Research Design, and Statistical Analysis in Clinical Psychology II (3-4) *Prereq: CLP 6527C.* Continuation of CLP 6527C.

CLP 6905: Individual Work (1-4; max: 12) Reading or research in areas in clinical psychology.

CLP 6910: Supervised Research (1-4; max: 5) S/U.

CLP 6940: Supervised Teaching (1-5; max: 5) S/U.

CLP 6943: Core Practicum in Clinical Psychology (1-4; max: 8) *Prereq: consent of program director.* Supervised training in appropriate work settings. S/U.

CLP 6945: Advanced Practicum in Neuropsychology (1-3; max: 3) *Prereq: CLP 7427, consent of area head and program director.* Supervised clinical experience in neuropsychological assessment and cognitive rehabilitation of patients with neurologic impairments. S/U.

CLP 6946: Advanced Practicum in Applied Medical Psychology (1-3; max: 8) *Prereq: consent of area head and program director.* Supervised clinical experience in inpatient and outpatient consultation, assessment and intervention with psychosomatic, stress-related, and somatopsychic disorders. S/U.

CLP 6947: Practicum in Intervention (1-4; max: 18) *Prereq: consent of program director.* Designed for individual with special interests and needs. S/U.

CLP 6948: Advanced Practicum in Clinical Child Psychology (1-3; max: 8) *Prereq: CLP 6943, consent of area head and program director.* Supervised clinical experiences working with children or

adolescents in either inpatient or outpatient settings. S/U.
CLP 6971: Research for Master's Thesis (1-15) S/U.
CLP 7317: Advanced Health Psychology and Behavior Medicine (3) *Prereq: CLP 7936.* Theory, research, and clinical applications related to core topic areas. Special attention to pathophysiology, research methods, issues of diversity, and ethical concerns.
CLP 7404C: Special Issues, Methods, and Techniques in Psychological Treatment (3; max: 12) *Prereq: CLP 6407, 6417, or consent of instructor.*
CLP 7427C: Neuropsychological Assessment of Children (3) *Prereq: PSB 6067 or consent of instructor.* Research, theory, and basic procedures.
CLP 7428C: Neuropsychological Assessment of Adults (3) *Prereq: PSB 6067 or consent of instructor.* Research, theory, and basic procedures.
CLP 7934: Special Topics In Clinical Psychology (1-9; max: 15) *Prereq: admission to CLP.* Advanced seminar for in-depth examination of selected issues and topics.
CLP 7949: Internship (1-2; max: 6) *Prereq: admission to candidacy for the doctorate, successful completion of the qualifying examination, and consent of the program director.* Reading assignments and conferences. Must include 1500 work hours; designed as a 2-semester sequence. S/U.
CLP 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
CLP 7980: Research for Doctoral Dissertation (1-15) S/U.
DEP 6216: Psychological Disturbances of Children (3) *Prereq: admission to CLP or PSY or consent of instructor.* Stresses both affective and cognitive.
GEY 6206: Interpersonal Communication Within the Aging Network(3) *Prereq: GEY 6646.* Effective communication with clients, caregivers, and care teams. Dealing with conflict, therapeutic relationships, interviewing, report-writing, intergenerational communication, and cultural considerations.
GEY 7408: Psychotherapy with Older Adults(3) *Prereq: admission to graduate study in counseling psychology or clinical and health psychology or consent of instructor; PCO 7944 for counseling psychology or CLP 6407 for clinical and health psychology.* Psychotherapeutic interventions with older adults.

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Clinical and Translational Science

College of Medicine

Graduate Faculty

Director and Graduate Coordinator: M. Limacher. *Complete faculty listing by department*: Follow this link

This unique concentration in the Master of Science program in medical sciences was developed by an interdisciplinary faculty to provide sound didactic background in the foundations of clinical research. Core course requirements cover study design, data analysis, ethical conduct of research, epidemiology, manuscript and abstract writing, and grant writing. Additional electives in specific fields may be taken from other concentrations or programs. A research thesis designed and conducted with a clinical research mentor is required.

For clinically trained M.D.s and other doctoral-level health professionals, the M.S. concentration in clinical and translational science (MS-CTS) may be part of a more-complete training experience in clinical research offered through the College of Medicine as the Advanced Postgraduate Program in Clinical Investigation (APPCI). For more information, contact Dr. Marian Limacher, Program Director, P.O. Box 100277, Health Science Center, Gainesville, FL 32610.

In addition to the courses listed below, the following courses are part of the core curriculum and are approved for major credit toward the MS-CTS:

- GMS 6190: APPCI Seminar

- GMS 6811: Grant Writing
- GMS 6861: Biostatistics I
- GMS 6862: Biostatistics II
- GMS 6903: Manuscript/Abstract Writing for the Clinician/Scientist
- GMS 6905: Independent Study
- GMS 6910: Supervised Research
- GMS 6931: Ethical/Policy Issues in Clinical Research
- GMS 6971: Master's Thesis Research
- GMS 7093: Introduction to Clinical/Translational Research
- PET 5936: Current Topics in Exercise and Sport Sciences (Grant Writing)

GMS 6903: Manuscript and Abstract Writing for Clinician/Scientists (2) *Prereq: consent of instructor.* Didactic and interactive sessions to improve the quality of manuscript and abstract writing.
GMS 6931: Ethical and Policy Issues in Clinical Research (2) Ethical and policy issues relating to conduct of clinical research. Basic understanding of regulations governing research on human subjects. Introduction to the topic of research with animals.
PET 5936: Special Topics/Seminars (1-3)
PHC 6001: Principles of Epidemiology in Public Health(3) Epidemiology methods frequently used to study disease patterns in community and clinic-based populations. Includes distribution and determinants of health-related states or events in specific populations and application to control of health problems.
PHC 6937: Special Topics in Public Health(1-6; max: 12)

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Communicative Disorders

College of Public Health and Health Professions

Graduate Faculty

Chair: C. Sapienza. *Graduate Coordinators:* B. Vinson (Speech Language Pathology) and S. Griffiths (Audiology). *Complete faculty listing by department*: Follow this link

Graduate programs in the Department lead to Master of Arts, Doctor of Philosophy, and Doctor of Audiology degrees. Also offered is a specialization in communication neuroscience. Information regarding these programs may be found at http://cd.phhp.ufl.edu/.

Major areas of emphasis include audiology, phonetic science, and speech-language pathology. Students, in conjunction with their supervisory committees, develop graduate programs to meet their specific needs and interests. Graduate specializations and programs in speech-language pathology and audiology are accredited by the Council on Academic Accreditation/American Speech-Language-Hearing Association. In addition, the Department offers advanced clinical training for interns and practicum students through the Speech and Hearing Center, a clinical service unit of Shands Hospital at the University of Florida. The Department has academic ties with other colleges and departments in the University and with the training and service programs of the Shands Health Care System and the Veterans Administration Medical Center, including the Brain Rehabilitation Research Center and the Rehabilitation Outcomes Research Center.

Students must contact the graduate coordinator to obtain information about specific specialty requirements. The application

deadline for fall admission is February 1. Entering master's students with deficiencies in the major area of study or with a bachelor's degree in another field of study must fulfill basic prerequisites during the first year of graduate work. There are no specific undergraduate courses required for admission to the Au.D. degree program.

Admission to degree-granting programs is via application to the respective faculty committees.

ASL 5406: Manual Communication with the Hearing Impaired (1; max: 3) Overview of signing systems, including ASL, Signed English, and Signing Exact English. Emphasis on signing skills most useful to audiologist.
LAE 6505: Applied Preschool Language Disorders: Diagnosis and Treatment(3) Seminar and practicum in diagnoses and treatment of preschool children with language learning disabilities.
SPA 5051: Clinical Observation in Audiology (1) *Prereq: for beginning graduate students in audiology.* Opportunity to observe various phases of audiologic practice and to accumulate a minimum of 15 hours of observation experience.
SPA 5102: Auditory Anatomy and Physiology (2) In-depth coverage of anatomy and physiology of auditory system to support understanding of auditory function in persons with healthy auditory mechanisms and those with specific disorders.
SPA 5128: Speech Perception (2) Understanding speech perception in hearing-impaired and/or aged listeners. Auditory and cognitive hypotheses to explain speech-recognition deficits; and clinical and theoretical intervention strategies to alleviate perceptual deficits in these populations.
SPA 5204: Phonological Disorders (3) Advanced principles of diagnosis and remediation.
SPA 5211: Voice Disorders (3) Advanced theory and techniques of diagnosis and remediation.
SPA 5225: Principles of Speech Pathology: Stuttering (3) Advanced theories and techniques of diagnosis and therapy.
SPA 5245: Communicative Disorders Related to Cleft Palate (3) *Prereq: SPA 5204, 5211, 5403.* Lectures and laboratory study of the "team approach" and interdisciplinary aspects of communicative disorders in the cleft palate individual.
SPA 5304: Principles of Audiological Evaluation (3) Advanced procedures in speech audiometry, masking, and audiogram interpretation.
SPA 5315: Peripheral and Central Auditory Disorders (2) Understanding (1) anatomy and physiology of peripheral and central auditory mechanism, (2) etiology and pathology of peripheral and central hearing loss, and (3) audiological and otologic diagnosis/treatment of hearing loss.
SPA 5401: Speech Pathology Language Disorder (3) Advanced theory and techniques of diagnosis and remediation of language disorders in infants and preschoolers.

SPA 5405: Language Disorders II (3) Detailed examination of language intervention programs and nonvocal communication systems.
SPA 5553: Instrumentation and Diagnosis in Speech-Language Pathology (2) Hands-on experience using instrumentation in diagnosis.
SPA 5563: Psychosocial Aspects of Hearing Loss (2) Psychological implications of hearing impairment. Specifically psychoeducational/psychosocial and counseling strategies and rehabilitation procedures for patient and family management.
SPA 5646: Speech and Language of the Deaf and Hard of Hearing (2) Advanced principles and procedures in the assessment and development of speech and language in individuals with hearing loss.
SPA 6008: Medical Aspects of Speech-Language Pathology (1) *Prereq: SPA 7946.* Overview of the speech pathologist's role in the medical environment. S/U.
SPA 6010: Basic Auditory Sciences (3) The nature of sound, the structure and function of the auditory system, frequency selectivity, auditory filtering, and the psychoacoustics of pure tones and complex sounds.
SPA 6117: Science of Singing (3) Intended for voice or CSD majors with interest in singing voice, its production, and its maintenance as instrument of health and beauty. Introduction to anatomy and physiology of speech mechanism and acoustics of voice production.
SPA 6133L: Hearing Aid Analysis Laboratory (1) *Coreq: SPA 6345.* Advanced analysis and description of the electroacoustical properties of hearing aids.
SPA 6207: Applied Phonological Disorders: Diagnosis and Treatment (3) *Prereq: majors only.* Seminar and practicum.
SPA 6211: Applied Voice Disorders: Diagnosis and Treatment (3) *Prereq: majors only.* Seminar and practicum.
SPA 6217: Vocal Health and Habilitation (3) Production of normal voice. Identifying and managing vocal problems specific to the singer or performer.
SPA 6229: Applied Fluency Disorders: Diagnosis and Treatment (3) *Prereq: majors only.* Seminar and practicum.
SPA 6233: Speech Motor Control Disorders (3) Developmental and acquired neurogenic speech disorders and their associated neuropathology, etiology, characteristics, assessment practices, and treatment strategies.
SPA 6270: Auditory Processing Disorders (3) *Prereq: SPA 5304, 5102.* Anatomy and physiology of the central auditory nervous system, and disorders of auditory processing that occur in humans. Focuses on evaluation and treatment of auditory processing disorders.
SPA 6300: Introduction to Graduate Research (3) *Prereq: required of all graduate students specializing in speech-language pathology or audiology.*
SPA 6305: Pediatric Audiology (3) *Prereq: SPA 6313.*

SPA 6311: Medical Audiology (2) Differential diagnosis of hearing impairment.
SPA 6312: Advanced Audiology and Neuro-Otology (2) *Prereq: SPA 6311.* Medical description, case presentation, and management of hearing loss.
SPA 6317: Vestibular Disorders (2) *Prereq: graduate status.* Mechanics and physiology of human balance, contribution of inner ear to balance, disorders of balance, and approaches to diagnostic assessment and rehabilitation.
SPA 6323: Audiologic Rehabilitation for Adults (2) Explores theoretical and clinical literature. Describes assessment and management strategies.
SPA 6324: Audiologic Rehabilitation for Children (2) Explores theoretical and clinical literature. Assessment and therapy techniques for children.
SPA 6340: Amplification I (2) Theoretical and applied understanding of current technology in amplification systems for the hearing impaired. Seminar format (2/3) and clinical laboratory activities (1/3).
SPA 6341: Amplification II (2) *Prereq: SPA 6340.* Digital and programmable technology in hearing aids.
SPA 6342: Amplification III (2) Theoretical and applied understanding of current and future technology in amplification systems. Recent advances in programmable and digital hearing aids. Hearing aid selection procedures for special populations. Assistive learning devices. Classroom amplification systems.
SPA 6390: Proseminar: Speech-Language Pathology and Audiology (3) Current professional issues including federal and state regulations, audiologic jurisprudence, audiological management, and interfacing with other professionals.
SPA 6410: Adult Language Disorders (3) The nature of acquired aphasia and related disorders. Applying neurolinguistic and neuropsychological models to methods of assessment and treatment.
SPA 6416: Applied Neurogenic Disorders: Diagnosis and Treatment (3) *Prereq: majors only.* Seminar and practicum.
SPA 6430: Applied Developmental Disorders: Diagnosis and Treatment in Speech and Language (3) *Prereq: majors only.* Seminar and practicum.
SPA 6436: Issues in Autism Spectrum Disorders (3) Review of related issues including diagnosis, intervention, and current research.
SPA 6506: Clinical Clerkship in Audiology (1; max: 3) Beginning-level audiologic practicum.
SPA 6507: Applied Augmentative and Alternative Communication (3) Introduction to clinical experience through planning, conducting, and writing up diagnostic and therapy sessions with individuals who have little or no functional speech and or writing.
SPA 6521: Practicum in Speech-Language Diagnostics: UFSHC (1-6; max: 6) *Prereq: SPA 5553.*

SPA 6524: Practicum in Speech-Language Therapy: UFSHC (1-6; max: 6)
SPA 6531: Clinical Practice in Hearing Assessment (1-6; max: 6)
SPA 6533: Clinical Practice in Aural Rehabilitation (1-6; max: 6)
SPA 6559: Alternative and Augmentative Communication (2) *Prereq: SPA 5403, 5405.* Survey of issues and research into the use of unaided and aided augmentative and alternative communication methods by persons with deficits in speech and writing.
SPA 6564: Communication and Aging (3) Characteristics of, and management approaches for, communication disorders found with some frequency in the elderly. Focues on enhancing communication.
SPA 6565: Seminar in Dysphagia (3) Anatomy, physiology, and neurology of normal swallow. Review of further diagnostic procedures and treatment protocols.
SPA 6568: Clinical Evaluation in Medical Speech-Language Pathology (3) *Prereq: SPA 6008.* Framework for evaluating communication and swallowing skills of patients at all levels of care across many types of disorders.
SPA 6570: Seminar: Professional Aspects of Speech-Language Pathology (3) Administration of speech-language pathology services in varied settings (hospitals, schools, community clinics, private practice, universities) studied from educational, legal, business, and ethical perspectives.
SPA 6581: Special Clinical (1-9; max: 12) Advanced study in specific areas of clinical process.
SPA 6830: Communication Disorders in Medically Complex Pediatric Populations (3) *Prereq: SPA 6008.* Clinical research.
SPA 6905: Individual Study (1-3; max: 9) *Prereq: consent of instructor.* Supervised study of specialized topic or research project.
SPA 6910: Supervised Research (1-5; max: 5) *Prereq: SPA 6300, and consent of instructor.* S/U.
SPA 6930: Proseminar in Speech-Language Pathology and Audiology (1; max: 6) Faculty and graduate student research in speech-language pathology, audiology, and related disciplines. S/U.
SPA 6935: Applied Reading Disabilities: Diagnosis and Treatment (3) *Prereq: majors only.* Seminar and practicum in diagnosis and treatment of developmental reading disabilities.
SPA 6936: Special Topics (3; max: 9) *Prereq: consent of instructor.* Theory and research in communication.
SPA 6940: Supervised Teaching (1-5; max: 5) S/U.
SPA 6942: Externship in Speech-Language Pathology (7-12; max: 12) Full-time supervised clinical experience in speech-language pathology. Students provide diagnostic and therapeutic services in clinical setting.
SPA 6971: Research for Master's Thesis (1-15) S/U.
SPA 7132C: Clinical Instrumentation for Evaluating Upper Aerodigestive Tract Functions (3; max: 3) Introduction to instrumentation used in clinical evaluation and treatment and clinical research. Experiential component.

SPA 7306: Audiologic Assessment in a Medical Setting (5) *Prereq: open only to students in the distance learning Au.D. program.* Audiologic and medically related aspects of hearing disorders.

SPA 7318: Clinical Auditory Electrophysiology (5) *Prereq: open only to students in the distance learning Au.D. program.* Understanding clinical auditory physiological measures, including auditory-evoked and event-related potentials, otoacoustic emissions, and common clinical protocols applied to auditory disorders.

SPA 7319: Balance Disorders: Evaluation and Treatment (5) *Prereq: open only to students in the distance learning Au.D. program.* Understanding how humans maintain balance, the contribution of the inner ear to balance, disorders of balance, and approaches to rehabilitation of these disorders.

SPA 7325: Audiologic Rehabilitation (5) *Prereq: open to students in the distance learning Au.D. program.* State-of-the-art information on current philosophies and practice patterns for audiologic habilitation and rehabilitation.

SPA 7343: Cochlear Implants and Assistive Devices (5) *Prereq: open only to students in the distance learning Au.D. program.* Fitting practices and future directions.

SPA 7348: Principles of Amplification (5) *Prereq: open only to students in the distance learning Au.D. program.* Recent information regarding amplification systems.

SPA 7353: Environmental Hearing Conservation (5) *Prereq: open only to students in the distance learning Au.D. program.* Recent information regarding the causes of hearing loss, prevention strategies, and basic mechanisms underlying noise-induced hearing loss.

SPA 7354: Seminar in Audiology: Hearing Conservation and Noise Control (3)

SPA 7391: Business and Professional Issues in Audiology (5) *Prereq: open only to students in the distance learning Au.D. program.* Overview of the healthcare system, the place of audiology in the system, current issues facing the profession, ethics of audiologic practice, providing reimbursement for services, and personnel management.

SPA 7415: Neurolinguistics of Adult Language Disorders (3) *Prereq: SPA 6410, LIN 6932, or consent of the instructor.* Psycho- and neurolinguistic research on acquired language disorders. Theoretical models of language representation and implications for treatment.

SPA 7500: Public School Practicum (1-3; max: 10) *Prereq: majority of preprofessional courses.* Experience in partial fulfillment of department's clinical requirements.

SPA 7523: Practicum in Speech Pathology in a Medical/Dental Setting (1-6; max: 6) *Prereq: SPA 6521, 6524, and consent of department.*

SPA 7540: Diagnosis and Treatment of Language and Language-Based Literacy Disorders (3) *Prereq: graduate-level reading course.* Clinical aspects of intervention for children and

adults who have language disabilities, focusing on identification, diagnosis, and treatment of emergent literacy and language disorders.

SPA 7566: Counseling Individuals with Hearing Losses (5) *Prereq: open only to students in the distance learning Au.D. program.* Recent information about counseling.

SPA 7821: Supervised Clinical Research (1-12; max: 12) Advanced clinical research topics in speech-language pathology and audiology. S/U.

SPA 7833: Audiology Research Project (3-6; max: 6) S/U.

SPA 7937: Seminar in Advanced Studies of Language and Literacy Development and Disabilities (3) *Prereq: consent of instructor.* Contemporary theories, research, and clinical applications in the areas of language and literacy for typical and atypical learners.

SPA 7945: Graduate Practicum in Audiology (3-6; max: 15) Intermediate clinical practicum for Au.D. students.

SPA 7946: Clinical I: Practicum in Medical Speech and Language Pathology (1-10; max: 10) *Prereq: minimum 50 clock hours of graduate clinical practicum.*

SPA 7947: Clinical II: Practicum in Advanced Medical Speech-Language Pathology (1-10; max: 10) *Prereq: minimum 5 hours of SPA 7946 or equivalent.*

SPA 7958: Clinical Externship (3-12; max: 36) *Prereq: 12 hours of SPA 7945.*

SPA 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

SPA 7980: Research for Doctoral Dissertation (1-15) S/U.

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Comparative Law

Fredric G. Levin College of Law

Graduate Faculty

Director and Graduate Coordinator: D. M. Hudson. *Complete faculty listing by department*: Follow this link

The LL.M. in Comparative Law degree is designed for graduates of foreign law schools who want to enhance their understanding of the American legal system and the English common law system from which it evolved. Requirements for this degree are given in the *General Information* section of this catalog.

The program begins with Introduction to American Law, a 4-credit summer course that gives students a foundation in the American legal process. It also helps students acclimate to the College of Law and the University community before to the start of the academic year. During the fall and spring terms, and with the director's approval, students choose their remaining 22 credits from more than 100 Juris Doctor and LL.M. in Taxation courses and seminars. For admission information consult the *College of Law Prospectus* or write to the Comparative Law Office P.O. Box 117643, University of Florida, Gainesville, FL 32611-7643 USA.

LAW 7906: Directed Research for LL.M. in Comparative Law (1-2; max: 2) Legal research to be completed under the supervision of a faculty member conversant the with topic selected and culminating in a paper.
LAW 7932: Introduction to American Law (4) Intensive 3-week introduction to American legal education, the legal system, and legal writing; and to the resources in the Legal Information Center.

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Computer and Information Science and Engineering

College of Engineering

Graduate Faculty

Chair: S. K. Sahni. *Graduate Coordinator:* J. Peir. *Complete faculty listing by department*: Follow this link

The Department of Computer and Information Science and Engineering (CISE) offers

--Master of Engineering, Master of Science, Engineer, and Ph.D. degrees in computer engineering through the College of Engineering

--Master of Science degree in digital arts and sciences through the College of Engineering

--Master of Science degree in computer science through the College of Liberal Arts and Sciences.

Requirements for these degrees are given in the *General Information* section of this catalog. The CISE Department has six broad areas of specialization:

--**Computer systems**: computer architecture, distributed systems, networks and communication, operating systems, performance evaluation, security, mobile computing, software engineering, programming languages, multimedia systems, and web technologies

--**Database and information systems**: database management systems, database design, database theory and implementation, data mining, database machines, parallel and distributed databases, digital libraries, E-services and commerce, medical, and bio-informatics

--**High-performance computing/applied algorithms**: design and analysis of algorithms, data structures, parallel and distributed computing, medical algorithms, numerical methods, computational complexity, and applied computational geometry

--**Computer graphics, modeling, and art**: modeling methodology, simulation, virtual reality, aesthetic computing, computer arts, animation, real-time rendering, medical modeling, digital media, and musical acoustics

--**Intelligent systems and computer vision**: artificial intelligence, machine learning, visualization, image analysis and processing, pattern recognition, signal processing, biomedical imaging, and image databases

--**Computer networks and security**: wired and wireless networks, network routing and protocols, and QoS.

Applications for admission must be approved by both the Department and the college in which the student wishes to enroll. Applicants should have a strong computer science background.

All master's students must satisfy a core requirement by completing four specified graduate-level courses (12 credits) or their approved equivalents. Students can select a thesis or nonthesis option for the master's degree. Digital Arts and Sciences students must choose either thesis or project in lieu of thesis. All options require a minimum of 30 credit hours. The thesis degree requires:

--An additional 12 credits of course work beyond the core (a minimum of 6 graduate-level credits in CISE and with approval, at most 6 credits in some other department in the student's college), and a written thesis.

--A minimum of 6 credit hours must be taken in CIS 6971.

The non-thesis option requires:

--An additional 12 credits of letter-graded course work in CISE beyond the core

--6 letter-graded credits from either CISE or (with approval) from some other department in the student's college.

--Each nonthesis master's student is required to pass a comprehensive examination.

The Digital Arts and Sciences project in lieu of thesis option requires 6 credit hours of project/performance credits.

To be admitted to the Engineer degree program, students must have completed a master's degree in engineering. To earn the degree of engineer, a student must obtain at least a 3.0 GPA in at least 30 graduate credit hours beyond the master's degree, within 5 calendar years of enrollment. These credit hours may include CIS 6972, Research for Engineer's Thesis. Both thesis and nonthesis options exist for the Engineer degree. Note that credits counted toward the degree are not credited toward any other degree (including the Ph.D. if a Ph.D. is then pursued).

To demonstrate breadth and proficiency, all Ph.D. students must take 4 required core courses obtaining a 3.4 GPA in 3 of the 4 required core courses, with no more than one of the core courses receiving a letter grade below B, to be eligible to take the Ph.D. qualifying examinations.

Ph.D. students are required to take a minimum of 90 credit hours. Of these, at least 36 hours must be graduate-level CISE course work excluding individual study and research credits. A minimum of 3 hours must be taken in CIS 7980. A maximum of 30 credits may be awarded toward the Ph.D. degree from an appropriate master's degree.

The Database Systems Research and Development Center, the Software Engineering Research Center, the Center for Computer Vision and Visualization Center, and a number of other campus research centers provide opportunities for students enrolled in the program.

The department offers a combined bachelor's/master's degree program. Contact the Department's Student Services Center for information.

CAP 5100: Human-Computer Interaction (3) *Prereq: COP 3530, and any one programming course (CGS 2414, CGS 3460, or CGS 3464).* Topics related to interaction with technology, including interface design, software tools, 3-D interaction, virtual environments, interaction devices, collaboration, and visualization.
CAP 5416: Computer Vision (3) *Prereq: MAC 2312, CGN 3421 or C-language.* Introduction to image formation and analysis. Monocular imaging system projections, camera model calibration, and binocular imaging. Low-level vision techniques, segmentation and representation techniques, and high-level vision.
CAP 5510: Bioinformatics (3) *Prereq: CIS 3020 or equivalent.* Basic concepts of molecular biology and computer science.

Sequence comparison and assembly, physical mapping of DNA, phylogenetic trees, genome rearrangements, gene identification, biomolecular cryptology, and molecular structure prediction.

CAP 5515: Computational Molecular Biology (3) Algorithms related to molecular biology. Sequence comparisons, pattern matching, pattern extraction, graph techniques in phylogeny construction, secondary structure prediction, multiple sequence alignment, contig search, DNA computing, computational learning theory, and genetic algorithms.

CAP 5635: Artificial Intelligence Concepts (3) *Prereq: COP 3530.* Heuristic search, game theory, knowledge representation, logic, machine learning, AI languages and tools. Applications such as planning, natural language understanding, expert systems, and computer vision.

CAP 5705: Computer Graphics (3) *Prereq: COP 3530.* Display device characteristics; system considerations, display algorithms. Curve and surface generation. Lighting models and image rendering.

CAP 5805: Computer Simulation Concepts (3) *Prereq: COP 3530.* Introduction to concepts in continuous and discrete simulation. Emphasizes fundamental concepts and methodology, using practical examples from a wide variety of disciplines.

CAP 5xxxA: Mathematics for Intelligent Systems (3) *Prereq: MAC 2313, Multivariate Calculus; MAS 3114 or MAS 4105, Linear Algebra; STA 4321, Mathematical Statistics.* Mathematical methods commonly used to develop algorithms for computer systems that exhibit intelligent behavior.

CAP 6402: Aesthetic Computing(3) *Prereq: CAP 5705, 5805* Principles of artistically motivated, personalized representations of formal model structures in computing and mathematics.

CAP 6516: Medical Image Analysis (3) *Prereq: expertise in image proc./comp. vision, proficiency in C language or MATLAB.* Image formation, reconstruction mathematics (Fourier slice theorem, Abel, Hankel and Radon transforms), PDE-based denoising and segmentation, multidimensional clustering algorithms, iso-surface extraction, basic differential geometry of curves and surfaces, multidimensional splines, active 2D/3D models, image matching/registration with application to multimodal co-registration.

CAP 6610: Machine Learning (3) *Prereq: Mathematics for Intelligent Systems.* Concepts in developing computer programs that learn and improve with experience. Emphasis on methods based on probability, statistics, and optimization.

CAP 6615: Neural Networks for Computing (3) *Prereq: CAP 5635.* Neural network models and algorithms. Adaptive behavior, associative learning, competitive dynamics and biological mechanisms. Applications include computer vision, cognitive information processing, control, and signal analysis.

CAP 6617: Advanced Machine Learning (3) *Prereq: CAP 6610.* Advanced concepts in developing computer programs that learn and improve with experience. Emphasis on methods based on probability, statistics, and optimization.

CAP 6685: Expert Systems (3) *Prereq: CAP 5635.* Production

systems, meta-knowledge, heuristic discovery, indepth examination of several expert systems including TEIRESIAS, AM, DENDRAL, MYCIN, IRIS, CASNET, INTERNIST, BACON, PROSPECTOR.

CAP 6701: Advanced Computer Graphics(3) *Prereq: CAP 4730 or 5705 or consent of instructor.* Curved surface representations, representation and visualization of higher-dimensional fields, advanced rendering, collision detection and collision response, and scene navigation in context of high-level graphics environments.

CDA 5155: Computer Architecture Principles (3) *Prereq: CDA 3101, COP 3530, and COP 4600.* Fundamental design issues of processor and computer architecture, a variety of design approaches for CPU, memory, and system structure.

CDA 5636: Embedded Systems (3) *Prereq: CDA 3101, COP 3530, and any one programming course (CGS 2414, CGS 3460, or CGS 3464).* Design and verification of embedded systems including system level modeling/specification, design space exploration, hardware-software partitioning, architecture synthesis, compilation for area/power/performance code compression, real-time operating systems/databases, and functional validation of embedded systems.

CDA 6159: High Performance Computer Architecture (3) *Prereq: CDA 5155, COP 5615.* Design and evaluation of instruction-level (superscalar, superpipeline) and task-level (fine and coarse-grained) parallel architecture. Language and operating system support for instruction and task scheduling and task synchronization.

CEN 5035: Software Engineering (3) *Prereq: CIS 3020 and COT 3100.* Topics in projects organization, specification techniques, reliability measurement, documentation.

CEN 6070: Software Testing and Verification (3) *Prereq: CEN 5035.* Concepts, principles, and methods for software testing and verification. Topics include human and machine-based testing strategies, formal proofs of correctness, and software reliability.

CEN 6075: Software Specification(3) *Prereq: CEN 5035.* Concepts, principles, and methods for practical specification. System modeling, requirements exploration, validation and prototyping, and documentation techniques.

CIS 6905: Individual Study (1-3; max: 6) *Prereq: consent of faculty member supervising the study.* S/U option.

CIS 6910: Supervised Research (1-5; max: 5) *Prereq: graduate status in CIS.* S/U.

CIS 6930: Special Topics in CIS (3; max: 9) *Prereq: vary depending on topics.*

CIS 6935: Graduate Seminar(1; max: 12) Presentations by visiting researchers, faculty members, and graduate students. S/U.

CIS 6940: Supervised Teaching (1-5; max: 5) *Prereq: graduate status in CIS.* S/U.

CIS 6971: Research for Master's Thesis (1-15) S/U.

CIS 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students

who have been admitted to candidacy. S/U.
CIS 7980: Research for Doctoral Dissertation (1-15) S/U.
CNT 5106C: Computer Networks (3) Design, implementation, and internals of networks. Routing, congestion control, internetworking, TCP/IP, optimization, and proxy services.
CNT 5410: Computer and Network Security (3) *Prereq: COP 3530, COT 5405. Coreq: COP 4600.* Issues, analysis, and solutions. Viruses, worms, logic bombs, network attacks, covert channels, steganography, cryptology, authentication, digital signatures, electronic commerce.
CNT 5517: Mobile Computing (3) *Prereq: CEN 4500C.* Emerging topics of wireless and mobile computing and networking including mobile computing models, mobile-IP, adhoc networks, Bluetooth, and 802.11b. Mobile database access and mobile transactions in context of emerging field of M-commerce.
CNT 6107: Advanced Computer Networks (3) *Prereq: COP 5615, 5536, and CEN 5501C.* Computer network architecture, including topologies, media, switching, routing, congestion control, protocols, and case studies.
CNT 6885: Distributed Multimedia Systems (3) Design issues; survey of recent advances, including compression, networking, and operating system issues.
COP 5255: Concurrent Programming(3) *Prereq: COP 3100, 3530.* Overview of principles and programming techniques. Reasoning about concurrency, synchronization, program structuring, multi-threaded server applications.
COP 5536: Advanced Data Structures (3) *Prereq: COP 3530.* Development of efficient data structures used to obtain more efficient solutions to classical problems, such as those based on graph theoretical models, as well as problems that arise in application areas of contemporary interest.
COP 5555: Programming Language Principles (3) *Prereq: COP 3530.* History of programming languages, formal models for specifying languages, design goals, run-time structures, and implementation techniques, along with survey of principal programming language paradigms.
COP 5615: Distributed Operating System Principles (3) *Prereq: COP 4600.* Concepts and techniques for efficient management of computer system resources.
COP 5625: Programming Language Translators (3) *Prereq: COP 5555.* Anatomy of translators for high-level programming languages.
COP 5725: Database Management Systems (3) *Prereq: COP 3530, 4600, or equivalent.* Introduction to systems and procedures for managing large computerized databases.
COP 6726: Database System Implementation (3) *Prereq: COP 4600 and 4720 or 5725.* DBMS architecture, query processing and optimization, transaction processing, index structures, parallel query processing, object-oriented and object-relational databases, and related topics.
COP 6755: Distributed Database Systems (3) *Prereq: COP 5615,*

5725, and a course in computer networks. Distributed database systems including the areas of distributed database design, resource allocation, access plan selection, and transaction management.

COT 5405: Analysis of Algorithms (3) *Prereq: COP 3530.* Introduction and illustration of basic techniques for designing efficient algorithms and analyzing algorithm complexity.

COT 5520: Computational Geometry(3) *Prereq: COP 3530.* Design, analysis, and implementation of algorithms and date structures to solve geometric problems. Applications in graphics, robotics, computational biology, data mining, and scientific computing. Convex hulls, Voronoi diagrams, triangulations, arrangements, and range searching.

COT 6315: Formal Languages and Computation Theory (3) *Prereq: COP 3530 and familiarity with discrete mathematics and data structures.* Introduction to theoretical computer science including formal languages, automata theory, Turing machines, and computability.

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Criminology and Law

College of Liberal Arts and Sciences

Graduate Faculty

Director: L. M. Lanza Kaduce. *Graduate Coordinator:* J. S. Lane.
Complete faculty listing by department: Follow this link

Criminology & Law is an interdisciplinary department that offers a Master of Arts (M.A.) degree (thesis or nonthesis), a joint M.A./J.D. degree program, and the Doctor of Philosophy (Ph.D.) degree. Requirements for the M.A. and Ph.D. degrees are given in the *General Information* section of this catalog. The graduate program in criminology and law has two areas of special emphasis: crime and justice, and law and society. The degree programs are research-based and prepare students to conduct original exploration into relevant problems, issues, and policies. For more information about this program, visit the website (http://web.crim.ufl.edu), review the information published by the Graduate School (http://gradschool.rgp.ufl.edu/), and write to Criminology, Law, and Society, ATTN: Graduate Secretary, P.O. Box 115950, University of Florida, Gainesville, FL 32611-5950).

M.A. degree program: Admission to the master's degree program requires a bachelor's degree from a criminology/criminal justice or relevant social science or humanities program (political science, sociology, anthropology, psychology, philosophy, history, women's studies, etc.). Qualified students may enter the master's program as undergraduates through the combined B.A./M.A. program. Both M.A. options (thesis and nonthesis) require satisfactory completion of at least 36 credit hours. In addition to graduate courses in the major, a statistics course (STA 6126 Statistical

Methods in Social Research I, or its equivalent) is required for the M.A. degree.

Ph.D. degree program: The Doctor of Philosophy program includes a minimum of 90 semester hours of credit beyond the B.A. Students with a criminology or closely related M.A. received in the last 7 years from an accredited U.S. university may request that up to 30 hours credit from their M.A. work be counted toward this total. Those with an M.A. from this department may apply 36 hours. The Department requires Ph.D. students to complete at least 66 hours of course work (excluding research credits), including the M.A. hours. Qualifying examinations take place at the end of a student's course work.

Criminology, Law and Society/Law joint degree programs: The Department of Criminology, Law and Society (CLS) and the College of Law offer a joint degree program leading to an M.A. or a Ph.D. in Criminology, Law and Society and a J.D. in law. The joint degree programs enable students to earn both the degrees (the J.D. and the M.A. or the J.D. and the Ph.D.) in less time than would be required to earn both degrees consecutively. Students wishing to pursue the joint program must be admitted to both the Graduate School and the College of Law. These requirements include both the LSAT and GRE. Admission to one may precede the other. Students are encouraged to announce their intent to seek a joint degree as soon as possible. CLS allows 12 hours of appropriate law school courses to be credited toward the CLS degree. The 12 credits selected from the law curriculum must be approved by the graduate coordinator on the recommendation of the student's supervisory committee. The College of Law will permit 12 hours of credit earned in graduate courses to be credited toward the J.D.

CCJ 5934: Contemporary Issues in Criminology and Law (3; max: 12) Policy, theory, and research issues in crime, criminal justice, and law.
CCJ 6001: Proseminar in Crime, Law, and Justice (3) Interdisciplinary examination of the relationship between legal and social orders. Focuses on various functions of law, different forms of legal thought, development of law, and the impact of law/sanctions on society.
CCJ 6039: Law and Society (3) Interdisciplinary examination of relationship between legal and social orders. Focuses on various functions of law, different forms of legal thought, development of law, and the impact of law/sanctions on society.
CCJ 6063: Communities and Crime (3) Overview of issues in the study of communities and crime. Theories used to study neighborhood crime levels. Critical analysis of existing empirical research. Factors that influence neighborhood-level crime rates. Effects of neighborhood characteristics on behavior and outcomes of individuals.

CCJ 6092: Drugs, Crime, and Policy (3) Interdisciplinary introduction to the study of drugs, drug use, and drug control.
CCJ 6285: Criminal Justice Process (3) Police, courts, and the correction system.
CCJ 6619: Crime and the Life Course (3) Intensive examination of crime and the life course. How criminal activity is patterned over time.
CCJ 6643: White Collar Crime(3) White collar and corporate crime.
CCJ 6657: Alcohol, Drugs, and Crime (3) Research and perspectives on drug and alcohol use.
CCJ 6669: Race and Crime (3) Research and theoretical perspectives on the relationship between race and crime.
CCJ 6705: Research Methods in Crime, Law, and Justice(3) Research issues (qualitative, quantitative, and historical) associated with crime, law, and justice, including skills to become consumers and producers of research.
CCJ 6708: Research Issues in Crime and Deviance (3) Overview of data sources and research methods used to study delinquency, crime, and deviance.
CCJ 6712: Evaluation Research (3) Provides skills for evaluating criminology and criminal justice programs.
CCJ 6905: Independent Study(1-3; max: 6) Reading or research areas in criminology, law, and society. Topics not available in current courses.
CCJ 6910: Supervised Research (1-3; max: 3) S/U.
CCJ 6920: Seminar in Criminological Theory (3) Classic and contemporary explanations of criminal activity.
CCJ 6971: Research for Master's Thesis (1-9) S/U.
CCJ 7742: Research Methods in Crime, Law, and Justice II (3) *Prereq: CCJ 6705.* Quantitative and qualitative methods.
CCJ 7921: Professional Development in Criminology, Law, and Society (3) Professional aspects of research, teaching, and service activities in the areas of crime, justice, law, and society. S/U.
CCJ 7979: Advanced Research(1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
CCJ 7980: Research for Doctoral Dissertation(1-15) S/U.
CJC 6120: Corrections and Public Policy (3) Issues associated with corrections and public policy. Incarceration, community corrections, and probation.
CJL 6089: Humanitarian Law (3) Concepts and rules dealing with human rights law of armed conflict.
CJL 6090: Law and Social Science (3) The interface between law and knowledge from various social scientific disciplines, including psychology, sociology, history, and anthropology.
CJL 6091: Anthropology of Law (3) The nature of law cross-culturally and cross-nationally. Relationships with various forms of socioeconomic and political organization.

CJL 6095: Human Rights in Cultural Context (3) The nature of human rights cross-culturally. History of the concept, its development, universalism vs. cultural particularism, religion, gender, and human rights in peace and in war.

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Dental Sciences

College of Dentistry

Graduate Faculty

Endodontics Chair and Graduate Coordinator: R. Pileggi. *Orthodontics Chair and Graduate Coordinator:* T. T. Wheeler. *Periodontology Chair:* I. Aukhil. *Graduate Coordinator:* T. Lundgren. *Prosthodontics Chair:* A. E. Clark. *Graduate Coordinator:* E. O'Neill. *Complete faculty listing by department*: Follow this link

The College of Dentistry offers the Master of Science degree in dental sciences with concentrations in endodontics, orthodontics, periodontics, and prosthodontics. These concentrations include a minimum of 38 hours of appropriate course work and research in topics relevant to each specialization. Requirements for the master's degree include:

--Satisfactory completion of all course work
--Meeting the requirements for clinical certification in the respective dental specialty
--Thesis or project based on research.

Prerequisites for admission, in addition to those of the Graduate School, include:

--D.D.S. or D.M.D. degree
--Completion of Parts I and II of the American Dental Association's National Board of Dental Examinations.

The application deadline for Endodontics and Periodontics is September 1. The application deadline of Orthodontics and

Prosthodontics is October 1. Send applications to Master of Science Program, College of Dentistry, P.O. Box 100402, Health Science Center, University of Florida, Gainesville, FL 32610-0402. Requirements for the M.S. degree are given in the *General Information* section of this catalog. The following courses are part of the core curriculum required for all specializations:

--DEN 6674: Advanced Oral Pathology
--GMS 6160 and GMS 6161: Introduction to Oral Biology I and II
--GMS 6609: Advanced Gross Anatomy
--GMS 6190: Responsible Conduct of Biomedical Research
--GMS 6841: Design and Analysis of Translational Research in Biomedical Sciences

Those not in Dentistry are given in-department graduate credit. Registration in the courses listed below is restricted to students currently admitted to a program in the College of Dentistry.

Endodontics

DEN 6642: Introduction to Advanced Endodontics (1) *Prereq: consent of instructor.* Analysis of principles, philosophies, and treatment procedures relative to morphology, physiology, and pathology of human dental pulp and periradicular tissues.
DEN 6643: Treatment Planning/Cases Presentation (1) *Prereq: DEN 6642.* Seminars to analyze patient treatment plans with regard to differential diagnosis and treatment of oral pains of pulpal and/or periradicular origin, vital pulp therapy, nonsurgical and surgical root canal therapy, intentional replantation and replantation of avulsed teeth, endodontic implants, and bleaching of discolored teeth.
DEN 6644: Nonsurgical Endodontic Care I (1) *Prereq: DEN 6642.* Supervised clinical experience in comprehensive management of patients' needs in areas of differential diagnosis of pulp and periradicular disease, vital pulp therapy, nonsurgical root canal therapy, bleaching of discolored teeth, and procedures related to coronal restorations by means of post and/or cores involving root canal space.
DEN 6645: Nonsurgical Endodontic Care II (1) *Prereq: DEN 6644.* Continuation of DEN 6644.
DEN 6646: Surgical Endodontics I (1) *Prereq: DEN 6642.* Supervised clinical experience in comprehensive management of patients' needs in areas of differential diagnosis of pulp and periradicular disease requiring surgical intervention, selective removal of pathological tissue resulting from pulpal pathosis, intentional replantation and replantation of avulsed teeth, surgical removal of tooth structure such as in apicoectomy, hemisection, and root amputation and endodontic implants.
DEN 6647: Surgical Endodontics II (1) *Prereq: DEN 6646.* Continuation of DEN 6646.

General

DEN 6674: Advanced Oral Pathology (1) Survey of clinical characteristics, microscopic features, and treatment and prognosis of diseases affecting the head and neck, oral mucosa, and jaws.
DEN 6675: Craniofacial Pain (1) *Prereq: consent of instructor.* Structure, function, and pathofunction of cranio-cervical region and stomatognathic system emphasizing differential diagnosis and case-specific management.
DEN 6678: Advanced Oral Medicine and Drug Interactions in Dentistry (2) *Prereq: consent of instructor. Designed for dental specialty and general practice residents.* Understanding medications available to practicing dentists.
DEN 6905: Individual Study(1-3; max: 6)
DEN 6910: Supervised Research (1-5; max: 5) S/U.
DEN 6935: Special Topics in Dentistry (1-3; max: 6)
DEN 6936: Practice Management (1) Fundamental management principles and practices. Emphasizes establishing the dentist in practice without making major business mistakes. Consideration to selecting an associate, developing an association contract, and understanding the associate relationship. S/U.
DEN 6940: Supervised Teaching (1-5; max: 5) S/U.
DEN 6941: Clinical Teaching in Dentistry (1) Assessing recall factors that influence learning in clinical situations. Accessing relevant learning and factors while in clinical situations, thus providing effective instructional decisions. Designed to help the participant recall and use this information. S/U.
DEN 6971: Research for Master's Thesis (1-6) S/U.
DEN 6973: Project in Lieu of Thesis (1-9; max: 9) *Prereq: consent of instructor.* Project or research acceptable to the candidate's supervisory committee and the Graduate School. S/U.

Orthodontics

DEN 6602: Orthodontic Treatment–Appliance Management and Effect of Treatment Part 1: Class I Treatment (1) *Prereq: consent of instructor.* Survey of all methods and techniques used to treat various malocclusions and their basic biologic principles.
DEN 6603: Orthodontic Treatment–Appliance Management and Effect of Treatment Part 2: Class II Treatment (1) *Prereq: consent of instructor.* Continuation of DEN 6602.
DEN 6604: Orthodontic Treatment–Appliance Management and Effect of Treatment Part 3: Class II Treatment and Overbite Treatments (1) *Prereq: consent of instructor.* Continuation of DEN 6603.
DEN 6605: Orthodontic Treatment–Appliance Management and Effect of Treatment Part 4: Class II Treatment and Overbite Treatments (1) *Prereq: consent of instructor.* Continuation of DEN 6604.
DEN 6606: Orthodontic Treatment–Appliance Management and Effect of Treatment Part 5: Class III and Crossbite

Treatments and Soft Tissue Considerations (1) *Prereq: consent of instructor.* Continuation of DEN 6605.

DEN 6607: Orthodontic Treatment–Appliance Management and Effect of Treatment Part 6: Impactions, Transplantations and Stability (1) *Prereq: consent of instructor.* Continuation of DEN 6606.

DEN 6608: Analysis, Diagnosis, and Treatment Planning: Part I (1; max: 2) *Prereq: consent of instructor.* Information to aid in examining patient, gathering data, analyzing and manipulating data, diagnosing, and subsequent treatment plan development.

DEN 6609: Analysis, Diagnosis, and Treatment Planning: Part II (1; max: 2) *Prereq: consent of instructor.* Information to aid in examining a patient, gathering data, analyzing and manipulating data, diagnosing, and subsequent treatment plan development.

DEN 6610: Biology of Tooth Movement: Part I (1; max: 2) *Prereq: consent of instructor.* Review of literature related to biology of orthodontic tooth movement.

DEN 6611: Biology of Tooth Movement: Part II (1; max: 2) *Prereq: consent of instructor.* Review of literature related to biology of orthodontic tooth movement.

DEN 6612: Orthodontic Biomechanics: Part I (1; max: 2) *Prereq: consent of instructor.* Biomechanical principles, biomechanics in certain treatment approaches, methods of research in biomechanics.

DEN 6613: Orthodontic Biomechanics: Part II (1; max: 2) *Prereq: consent of instructor.* Biomechanical principles, biomechanics in certain treatment approaches, methods of research in biomechanics.

DEN 6614: Ortho-Perio Relationships: Part I (1; max: 2) *Prereq: consent of instructor.* Understanding the effects of orthodontics on periodontal tissue, treating the periodontally compromised patient, and literature on various periodontal procedures.

DEN 6615: Ortho-Perio Relationships: Part II (1; max: 2) *Prereq: consent of instructor.* Understanding effects of orthodontics on periodontal tissue, treatment of periodontally compromised patient, and literature on various periodontal procedures.

DEN 6616: Orthognathic Surgery: Part I (1; max: 2) *Prereq: consent of instructor.* Principles involved in correction of skeletal problems by orthodontics and oral and maxillofacial surgery.

DEN 6617: Orthognathic Surgery: Part II (1; max: 2) *Prereq: consent of instructor.* Principles involved in correcting skeletal problems by orthodontics and oral and maxillofacial surgery.

DEN 6618: Postnatal Growth and Development (1; max: 2) *Prereq: consent of instructor.* Review of topics in postnatal growth and development pertinent to orthodontics. Emphasizes basic concepts of facial growth.

DEN 6670: Craniofacial Anomalies(1; max: 2) *Prereq: consent of instructor.* Etiology, development, treatments, and treatment outcomes of craniofacial anomalies.

DEN 6671: Prenatal Growth and Development(1; max: 2)

Prereq: consent of instructor. Selected topics in cellular and molecular aspects of craniofacial development.
DEN 6672: Materials in Orthodontics(1; max: 4) *Prereq: consent of instructor.* Evaluation of the basics and the applicability of materials normally used in orthodontia, to enable the practioner to evaluate new materials commonly introduced in today's market.
DEN 6673: Critical Review of Pain Literature(1; max: 2) Rotating topics designed to teach students to critically review orofacial pain literature, with emphasis on clinical relevance. S/U.
DEN 6676: TMD and Orofacial Pain: Part I(1; max: 2) *Prereq: consent of instructor.* Principles involved in epidemiology, evaluation, diagnosis, and management of temporomandibular disorders (TMD) and orofacial pain.
DEN 6677: TMD and Orofacial Pain: Part II(1; max: 2) *Prereq: consent of instructor.* Principles involved in epidemiology, evaluation, diagnosis, and management of temporomandibular disorders (TMD) and orofacial pain.

Periodontics

DEN 6652: Review of Periodontics Literature I (1) Periodontal data collection, etiology of periodontal disease, pathogenesis of periodontal diseases, acute periodontal lesions, and classification of periodontal diseases.
DEN 6653: Review of Periodontics Literature II (1) *Prereq: DEN 6652.* Diagnosis, prognosis and treatment planning including tooth mobility and tooth movement, prognosis, plaque control and nonsurgical periodontal therapy.
DEN 6654: Review of Periodontics Literature III (1) *Prereq: DEN 6653.* Principles of periodontal surgery and wound healing.
DEN 6655: Review of Periodontics Literature IV (1) *Prereq: DEN 6654.* Mucogingival surgery, antibiotic therapy, ultrasonics, irrigation and maintenance of the periodontal patient. Discussion of restorative considerations and orthodontics.
DEN 6656: Introduction to Advanced Periodontology (1) Intense general review of periodontal structure, function and disease pathogenesis. Tissues of periodontium, cementum, bone, periodontal ligament and epithelial attachment. Review of etiology of disease process pertaining to microbial flora and host response.
DEN 6657: Periodontal Histology and Histopathology (1) Survey of histology and histopathology of periodontium, utilizing light and electron microscopy.
DEN 6658: Treatment Planning in Periodontal Therapy (1) Interdisciplinary seminar. Students present findings of examination of patients with advanced dental diseases and discuss diagnosis and treatment planning for these patients.

Prosthodontics

DEN 6622: Principles of Occlusion (2) Chronological history of gnathology and developing treatment philosophies. In-depth

biomechanical and neuro-physiological study of human dental occlusion. The role of sound occlusion in oral health, and current methods of treatment.

DEN 6623: Maxillofacial Prosthetics (1) The art and science of anatomic, functional, and cosmetic reconstruction, using nonliving substitutes for structures missing as a result of surgical intervention, trauma, or congenital malformation.

DEN 6624: Dental Implant Restoration (1) *Prereq: D.M.D. or D.D.S. degree.* Diagnostic and laboratory principles involved with restoration of dental implants.

DEN 6625: Fixed Prosthodontic Ceramics (1) *Prereq: D.M.D. or D.D.S. degree.* Laboratory and diagnostic principles associated with preparation and fabrication of metal and ceramic fixed partial prostheses.

DEN 6626: Advanced Removable Partial Dentures (1) *Prereq: D.M.D. or D.D.S. degree.* Principles and applications. Survey of supporting tissues, classification systems, biomechanics, treatment planning, materials, and historical overview of removable partial prosthodontics.

DEN 6627: Treatment Planning Seminar (1) *Prereq: D.M.D. or D.D.S. degree.* Format to evaluate treatment planning skills, to present comprehensive cases in organized and logical manner and to use literature and experience to defend treatment plans.

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Digital Arts and Sciences

College of Fine Arts

Graduate Coordinator: J. C. Oliverio.

Master of Arts degree in digital arts and sciences: The Master of Arts degree in digital arts and sciences (DAS) is a 2-year, interdisciplinary program. Students seeking admission are expected to have an undergraduate background including:

--A degree in one of the fine arts or liberal arts

--A body of work that demonstrates accomplishment in the intended area

--A body of work that can clearly be enhanced with skills to be acquired in the DAS program.

Deficiencies may be corrected before beginning graduate study. Admission into the program requires submitting a portfolio with digital representations of work done by the artist. The medium for this portfolio is digital, either on a CD or as a web page, preferably both.

DIG 5931C: Special Topics (1-3; max: 6) *Prereq: Admission in MA DAS program or consent of instructor.* Complements theory-based digital arts offerings with an up-to-the-minute examination of emergent cultural and technological events and developments.
DIG 6027C: Interactive Storytelling (1-4; max: 4) *Prereq: admission in MA DAS program or consent of instructor.* Integrates participation and storytelling as foundations of interactivity. Explores how storytelling is incorporated into contemporary interactive

platforms including games and social networks, using online and openâ€source tools to create content, taking advantage of mobile hardware already in students' possession.

DIG 6028: Roots of Digital Culture (1-3) *Prereq: admission in MA DAS program or consent of instructor.* Interdisciplinary approach to technological and cultural underpinnings shaping current digital media (video games, the Internet, computer-animated movies, virtual reality and online social networking), exploring and presenting individuated perspectives in both written and digital media assignments.

DIG 6050C: Entertainment Technology (1-4; max: 4) *Prereq: admission in MA DAS program or consent of instructor.* Evolving digital entertainment technologies and techniques, providing a forum to discuss current and future multimedia and hybrid media technologies, including the completion of an original design, script or treatment for a digital entertainment artifact.

DIG 6125C: Digital Design & Visualization (1-3; max: 6) *Prereq: admission in MA DAS program or consent of instructor.* Creation of 2D and 3D content for large-scale visualization systems employed in the creative services and industrial design fields. Providing participatory experience in controlling multi-screen sound and visualization environments in both intermediate and large-scale display environments.

DIG 6126C: Interaction Design (1-3; max: 6) *Prereq: admission in MA DAS program or consent of instructor.* Extend theoretical and practical perspectives into several focused projects using interaction principles prevalent in the entertainment and simulation industries, by creating and evaluating solutions across iterative design and testing cycles researching usability and affective influence. Emphasizes principles of cognitive psychology, including mental models, targeting and interface metaphors.

DIG 6788C: Digital Production & Game Design (1-4; max: 6) *Prereq: Admission in MA DAS program or consent of instructor.* Students form small production teams and collaborate on a semester-long project with appointed production milestones, exploring intermediate and advanced 2-D and 3-D game design and visualization paradigms.

DIG 6840C: Interdisciplinary Research Seminar in Digital Arts & Sciences (1-4; max: 6) *Prereq: admission in MA DAS program or consent of instructor.* Virtual World Environments (VWEs) as venues for rapid-prototyping of ideas, inventions, and interactions, addressing the implications of VWEs for communications, ethics, and public policy, by creating avatars and exploring digital media venues inside an online 3-D environment.

DIG 6850C: Digital Arts & Sciences Convergence (1-4; max: 4) *Prereq: admission in MA DAS program or consent of instructor.* Transformations resulting from the convergence of digital technologies and global cultures. Analyzes how film, video games, animation and the recording arts intersect in the creation of digital artifacts and cultural phenomena. Interdisciplinary teams study and undertake real-time international communications and

collaborations.

DIG 6950C: Digital Performance Production (1-4; max: 4) *Prereq: admission in MA DAS program or consent of instructor.* Provides instruction on the configuration, assembly and execution of events in venues using streaming technologies for a variety of entertainment, business and research applications. Students demonstrate individuated achievement in performance technologies and integrated techniques via a final event of their own design.

DIG 6971: Research for Master's Thesis (1-3; max: 6) *Prereq: Full-time student majoring in MA DAS program.*

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Economics

Warrington College of Business Administration

Graduate Faculty

Chair: J. H. Hamilton. *Graduate Coordinator:* S. M. Slutsky.
Complete faculty listing by department: Follow this link

The department offers the Master of Arts (thesis and nonthesis option) and Doctor of Philosophy degrees in economics with specializations in econometrics, economic theory, industrial organization, international economics, monetary economics, and public finance.

M.A. requirements: A minimum of 36 credits of course work is required for the M.A. with and without thesis. A maximum of six credits of the research course ECO 6971 may be included for a master's degree with thesis. The following core courses are required: ECO 7408 and ECO 7404 or equivalent, ECO 7415 or equivalent, ECO 7115, and ECO 7206.

Ph.D. requirements: Admission requirements for the Ph.D. include (a) a minimum grade point average of 3.0, (b) an acceptable score on the GRE, and (c) for nonnative speakers of English, an acceptable score on one of the following: TOEFL (Test of English as a Foreign Language: computer=213, paper=550, web=80), IELTS (International English Language Testing System: 6), MELAB (Michigan English Language Assessment Battery: 77), or successful completion of the UF English Language Institute program. Students in the Ph.D. program must complete the following core courses: ECO 7113, ECO 7115, ECO 7117, ECO 7120, ECO 7206, ECO 7272, ECO 7404, ECO 7406, ECO 7408, ECO 7415, ECO 7424, and ECO

7452. All core courses must be completed in the first year. In addition, students must complete courses in three fields of specializations and pass qualifying examinations in two of those fields.

Complete descriptions of the minimum requirements for the M.A. and Ph.D. degrees are provided in the General Information section of this catalog.

ECO 5715: Open Economy Macroeconomics (2) *Prereq: ECP 5702. Designed primarily for M.B.A. students.* International linkages arising from capital flows and exchange rates as well as comparison on macroeconomic policies and performance across countries. Effect of macroeconomic events on international business environment.
ECO 6075: Economics/Consumer Education (3) Objectives, content, resource materials, and methods of teaching economic/consumer education in the elementary and secondary schools.
ECO 6407: Game Theory and Competitive Strategy: Theory and Cases(3) *Prereq: Designed primarily for M.B.A. students.* Analysis of business problems with small number of decision makers. Oligopoly competition and coordination, entry deterrence reputation, and other problems. Problems and cases to illustrate principles using strategic analysis.
ECO 6409: Game Theory Applied to Business Decisions (2) *Prereq: ECP 5702 or equivalent. Designed primarily for MBA students.* Business settings analyzed wherein a few decision makers profoundly affect one another's well being. Oligopoly competition and coordination, nonprice choices, entry deterrence, reputation formation, contract design, and management of work teams.
ECO 6708: International Macroeconomics (3) *Prereq: ECP 5705. Designed primarily for M.B.A. students. Not designed for doctoral students in economics.* Macroeconomic policies and their effects on the international business environment.
ECO 6906: Individual Work in Economics (1-4; max: 8)
ECO 6910: Supervised Research (1-5; max: 5) S/U.
ECO 6936: Special Topics (1-4; max: 16)
ECO 6940: Supervised Teaching (1-5; max: 5) S/U.
ECO 6957: International Studies in Economics (1-4; max: 12) *Prereq: admission to approved study abroad program and permission of department.* S/U.
ECO 6971: Research for Master's Thesis (1-15) S/U.
ECO 7113: Information Economics (1-2; max: 2) *Prereq: ECO 7115 and 7408. Coreq: ECO 7404.* Analysis of information problems, remedies through contracting or adoption of different procedures and organization when complete contracting is infeasible.
ECO 7115: Microeconomic Theory (3) *Coreq: ECO 7408 or equivalent.* Analysis of optimization applied to consumer and product theory including comparative statistics and duality.
ECO 7117: Markets and Institutions(1-2; max: 2) Partial

equilibrium analysis of four basic market structures: competition, monopoly (monopsony), oligopoly, and monopolistic competition. Topics include pricing strategies, vertical integration, and bilateral monopoly. Examination of policy implications.

ECO 7119: Information, Incentives, and Agency Theory (3) *Prereq: ECO 7115.* Recent theoretical work in literature on design of incentive schemes in presence of limited information. Mathematical modeling and proof techniques emphasized.

ECO 7120: General Equilibrium and Welfare Economics (1-2; max: 2) *Prereq: ECO 7115. Coreq: ECO 7406.* Introduction to general equilibrium analysis, including existence of equilibrium, core convergence, and fundamental theorems of welfare economics.

ECO 7206: Macroeconomic Theory I (3) *Coreq: ECO 7115, 7408.* Classical, Keynesian, and new classical aggregate income and employment analysis. Demand for money. Inflation and unemployment. Monetary policy and stabilization. Time series and rational expectations models.

ECO 7272: Economic Growth I (1 or 2) *Prereq: ECO 7115 and 7415. Coreq: ECO 7406.* Introduction and overview of theoretical and empirical developments in determinants of long-run standards of living.

ECO 7404: Game Theory for Economists (1-2; max: 2) *Prereq: ECO 7115 and 7408.* Introduction to modern game theory as used in economics. Emphasis on use of techniques in simple applications.

ECO 7405: Mathematical Economics: Game Theory (3) *Prereq: ECO 7404 and 7408 or consent of instructor.* Advanced game theory including incomplete information games with application to economics.

ECO 7406: Dynamic Economics: Theory and Applications (1-2; max: 2) *Prereq: ECO 7115 and 7408.* Review of techniques and applications of dynamic optimization and growth with introduction to modern dynamic techniques to analyze growth, resource management, stabilization policy, capital accumulation, asset pricing, search behavior, and incentive contracting.

ECO 7408: Mathematical Methods and Applications to Economics (1-2; max: 2) Mathematical techniques used in graduate work in economics and finance. Linear algebra and differential equations, with emphasis on results used in economic theory and econometrics.

ECO 7415: Statistical Methods in Economics (3) *Coreq: ECO 7408.* Introduction to fundamental statistical concepts: estimation, hypothesis testing, linear regression, and analysis of variance.

ECO 7424: Econometric Models and Methods (3) *Prereq: ECO 7415.* Introduction to classical econometric theory, linear models, and estimation methods.

ECO 7426: Econometric Methods I (3) *Prereq: ECO 7424 or departmental approval.* Stochastic models. The general linear model and problems associated with its use in econometric research. Theory of the simultaneous equation approach, model construction, and estimation techniques.

ECO 7427: Econometric Methods II (3) *Prereq: ECO 7424 or*

AEB 6571. Advanced econometric theory with applications to topics such as nonlinear estimation, limited dependent variable models, time-series analysis, and specification testing.

ECO 7452: Best Empirical Practices in Economics(1-2; max: 2) Analysis of empirical papers to develop skills for evaluating and conducting empirical testing of economic theory.

ECO 7453: Practicum in Empirical Research(1) *Prereq: Ph.D. student.* Practical training for first-year Ph.D. students through all stages of research process culminating in generation of first draft of original research paper. H.

ECO 7506: Empirical Public Economics II(1-2; max: 2) Education, welfare policy, health policy, and environmental policy.

ECO 7516: Tax Theory and Public Policy (1-2; max: 2) *Prereq: ECO 7525.* Survey of economics of taxation. Optimal commodity and income taxation for efficiency and redistribution, tax incidence, capital taxation, and uncertainty and taxes.

ECO 7525: Welfare Economics and the Second Best (1-2; max: 2) *Prereq: ECO 7115.* Introduction and overview of public sector economics. Basic welfare economics, optimal commodity and income taxation, and public goods and welfare.

ECO 7534: Empirical Public Economics I (1-2; max: 2) *Prereq: ECO 7424 and 7525.* Taxation, expenditures, marketplace of local governments, federalism and sources of inefficiency in government, voter turnout.

ECO 7536: Theoretical Public Economics (1-2; max: 2) *Prereq: ECO 7115.* Topics related to externalities, public expenditure, optimal taxation, and social choice.

ECO 7706: Theory of International Trade (3) Historical and economic background of foreign trade; theory of international trade; fundamentals of international exchange; international commercial policies and international trade; exchange fluctuations and their control; international monetary institutions.

ECO 7716: International Economic Relations (3) International trade and income distribution, international technology diffusion, foreign direct investment and multinational enterprise, formation and reform of trade and investment policy.

ECO 7925: Research Skills Workshop (3) *Prereq: passed written qualifying exams.* Transition from learning about work of others to doing research. Selecting area of research, surveying literature, narrowing to specific topic, formulating model, collecting data if appropriate, working through theoretical or empirical analysis, and writing first draft. S/U.

ECO 7938: Advanced Economics Seminar (1-4; max: 8) *For advanced graduate students in economics. Student must have completed graduate core program and have preliminary dissertation topic.*

ECO 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

ECO 7980: Research for Doctoral Dissertation (1-15) S/U.
ECP 5415: Antitrust Policy and Managerial Decisions (2) *Prereq: ECP 5702. Designed primarily for M.B.A. students.* Overview of antitrust laws and review of their implementation. Examination of civil remedies available to injured persons. Evaluation of specific damage models.
ECP 5702: Managerial Economics (2; max:) *Prereq: Designed primarily for M.B.A. students.* Microeconomic forces that influence decisions made by firms. Cost concepts, pricing strategies, capital investment, human resource management, innovation, and the influence of the competitive environment of firms.
ECP 5705: Economics of Business Decisions (3) *Prereq: Designed primarily for M.B.A. students.* Synthesis and application of microeconomic theory and related business administration principles to managerial decision making through a problem-solving orientation.
ECP 6417: Public Policy and Social Control (3) *Prereq: Designed primarily for M.B.A. students.* Problems in developing and applying concepts of public interest in a market economy. Relationships among industrial structure, business conduct, and economic performance. Measurement of concentration and evaluation of performance.
ECP 6701: Competitive Strategies in Expanding Markets (2) *Prereq: ECP 5702; MBA and other master's students.* Identify and analyze strategies in expanding markets created by technological change and accelerated globalization.
ECP 6708: Cases in Competitive Strategy (2) *Prereq: ECO 6409. Designed for MBA students.* Current and recent cases to illustrate practical principles using strategic analysis. Class discussions of cases comprise first part; student presentations comprise second part. Practical business lessons from applying strategic methodology.
ECP 6709: Economics for Managing Information for Electronic Commerce (2) Special economic issues pertaining to commerce in information age. Questions relating to pricing of information services, protection of intellectual property, evaluation of information quality and accuracy, and design of markets to facilitate information flows.
ECP 7407: Theory of Industrial Organization:Product Differentiation and Strategy (1-2; max: 2) *Prereq: ECO 7115, ECO 7404, ECO 7117* Models of oligopoly with differentiated products, modern monopolistic competition models, and strategic moves in oligopoly.
ECP 7408: Empirical Industrial Organization (1-2; max: 2) *Prereq: ECO 7424 required; 7426 recommended or consent of instructor.* Empirical examination of current issues. Returns to scale, market structure, entry and exit, technological progress, and examination of particular regulated industries.
ECP 7426: Economics of Regulation (1-2; max: 2) Theory and practice of regulatory institutions, with focus on pricing and incentive issues. Analysis of alternatives to traditional regulatory

policy.

ECS 6423: Latin American Business Economics (2) Review of political, economic and cultural background of region including trade patterns and policies; direct foreign investment and multinational firms; determination of foreign exchange rate risk; effects of currency crises and monetary policies on business environment; corporate strategies relevant for Latin America; international marketing and finance strategies appropriate for region; and role of government policies affecting operations of firms.

HSA 6436: Health Economics (3) *Prereq: consent of instructor.* Fundamental economic relations governing production, consumption, reimbursement, and financing of health services. Characteristics of markets for acute and long-term care services, insurance, and health care labor. Economic evaluation of technology.

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Electrical and Computer Engineering

College of Engineering

Graduate Faculty

Chair: J. Harris. *Graduate Coordinator:* G. Bosman, J. McNair.
Complete faculty listing by department: Follow this link

The Department of Electrical and Computer Engineering offers the Master of Engineering, Master of Science, Engineer, and Doctor of Philosophy degrees. Minimum requirements for these degrees are given in the *General Information* section of this catalog.

The department offers graduate study and research in computer engineering, devices, electromagnetics and energy systems, electronics, and signals and systems.

Graduate students in the Department of Electrical and Computer Engineering have bachelor's degrees from many areas: electrical engineering, other engineering disciplines, chemistry, mathematics, physics, and other technical fields. The Department of Electrical and Computer Engineering offers both thesis and nonthesis options for the master's degrees.

In the *thesis option* a student shall complete a minimum of 30 semester credit hours with a maximum of 6 semester credit hours of EEL 6971 (Research for Master's Thesis). While the Graduate School sets the minimum requirements, the supervisory committee determines the appropriate number of thesis hours a student shall be required to take for the thesis. Other course requirements include a minimum of 18 hours at the 5000 or 6000 level in electrical and computer engineering. Excluded from satisfying these

course requirements are 5905 and 6905 (Individual Work), 6910 (Supervised Research), 6932 (Graduate Seminar), 6940 (Supervised Teaching), and 6971 (Research for Master's Thesis). No more than 6 hours of Individual Work (5905 or 6905) may be counted toward the degree.

In the *nonthesis option* a student shall complete a minimum of 30 semester credit hours with a maximum of 6 semester credit hours of Individual Work (5905 or 6905). The course requirements include a minimum of 21 semester credit hours at the 5000 or 6000 level in electrical and computer engineering. Excluded from satisfying these course requirements are 5905 and 6905 (Individual Work), 6910 (Supervised Research), 6932 (Graduate Seminar), 6940 (Supervised Teaching), and 6971 (Research for Master's Thesis).

The Department also offers a combined bachelor's/master's degree program. This program allows qualified students to earn both a bachelor's degree and master's degree with a saving of one semester. Qualified students may begin their master's programs while seniors, counting up to 12 hours of specified electrical and computer engineering graduate courses for both bachelor's and master's degree requirements. Bachelor's/master's program admission requirements are (1) satisfaction of Graduate School admission requirements for the master's degree, (2) an upper-division (undergraduate) GPA of at least 3.3, and (3) completion of at least 7 EEL core courses and 2 EEL laboratories. Students with a GPA between 3.3 and 3.59 can double count up to 6 hours, while students with a GPA of 3.6 or higher can double count up to 12 hours.

All prospective doctoral students must take the written part of the Ph.D. qualifying examination within the first year of enrollment. Other requirements for the doctoral degree, as well as requirements for master's and engineer degrees, are given in the Electrical and Computer Engineering Department's Graduate Guidelines (see http://www.ece.ufl.edu/academics/graduate/main.html) and in the front section of this catalog.

The following course listing indicates the major areas of faculty interest. Special topics courses EEL 5934 and EEL 6935 cover a wide variety of subjects for which there are no present courses.

EEE 5317C: Introduction to Power Electronics (3) *Prereq: EEL 3304, 3396. Coreq: EEL 4657.* Components and circuits for power applications. Switched-mode power supplies.
EEE 5320: Bipolar Analog IC Design (3) *Prereq: EEL 3304.* Amplifier stages, active loads, output stages, op-amps, feedback, frequency response, compensation.
EEE 5322: VLSI Circuits and Technology (3) *Prereq: EEL 3396, 3304.* Introduction to VLSI circuit technology and manufacturing. Fabrication, device models, layout, parasitics, and simple gate

circuits.

EEE 5336L: Solid-State Technology Laboratory (1) Solid-state device fabrication. Safety issues.

EEE 5400: Future of Microelectronics Technology (3) *Prereq: EEL 3396 or equivalent.* Survey of state-of-the-art microelectronics technology and prospects for future technologies. Nanoscale MOSFETs, strained Si, high-K gate dielectrics, carbon nanotubes, molecular electronics, and single-electron devices.

EEE 5405: Microelectronic Fabrication Technologies (3) *Prereq: EEL 3396.* Principles of microelectronic device fabrication. Emphasis on fundamentals of microfabrication processing and microelectronic device process flows. Computerized process simulation.

EEE 5426: Introduction to Nanodevices (3) Physical principles of modern solid-state devices and their applications; quantum mechanics; fundamentals of nanoelectronics.

EEE 6321: MOS Analog IC Design (3) *Prereq: EEL 5320 or 6311.* Design of analog circuits in CMOS IC technology. MOS switches, MOS op amp circuits, circuit simulation using SPICE.

EEE 6323: Advanced VLSI Design (3) *Prereq: EEL 5322.* Advanced very large scale integrated circuit design, testability, and performance evaluation. Use of industrial VLSI software. Building an advanced CMOS VLSI circuit.

EEE 6325: Computer Simulation of Integrated Circuits and Devices(3) *Prereq: graduate standing.* Basic methods of numerical simulation of semiconductor devices and electronic circuits with reference to PISCES and SPICE. PDE discretization; numerical integration, Newton/iterative linearization, linearized system solution.

EEE 6328C: Microwave IC Design (3) Fundamentals of microwave integrated circuit design. Use of computer software to design simple microwave circuits. Microwave circuit testing.

EEE 6374: Radio Frequency (RF) Integrated Circuits and Technologies (3) *Prereq: EEL 5322, 4306, or equivalent.* Requirements for RF integrated circuits. Design and implementation. Interdependence of RF circuit performance wit devices, parasitics, packages, and process technology.

EEE 6382: Semiconductor Physical Electronics (3) *Prereq: EEL 4351/EEL 5091.* Crystal structure and symmetry, carrier statistics, lattice dynamics, energy band theory, equilibrium properties of semiconductors, recombination-generation and trapping processes, electronic transport phenomena, scattering mechanisms, and optical properties.

EEE 6390: VLSI Device Design (3) *Prereq: EEL 4351/EEL 5091 or EEL 5400.* Criteria and tradeoffs in designing high-performance semiconductor devices in scaled (VLSI) Si-based integrated-circuit technologies.

EEE 6397: Semiconductor Device Theory I (3) *Prereq: EEL 4351/EEL 5091.* Semiconductor device physics, equilibrium and non-equilibrium processes, pn junctions, BJT operation, charge-control modeling, and high-current and heavy-doping effects.

EEE 6402: Nonclassical Si-Based Nanoscale CMOS Devices (3)

Prereq: EEL 6390 or EEL 6397. Physics underlying novel devices for extreme CMOS scaling. Unique effects in fully depleted SOI MOSFETS, multi-gate MOSFETS, FinFETS. Simulation-based project using a physics/process-based compact model for double-gate FETs.

EEE 6428: Computational Nanoelectronics (3) *Prereq: EEL 4351/EEL 5091 or EEL4329/EEL 5400.* Using nanotechnology simulation tools to study nanoscale devices; band structure, transport; molecular transistors, nanowires, nanotransistors, and quantum dots.

EEE 6431: Carbon Nanotubes (3) *Prereq: EEE 5400.* Basic semiconductor and solid-state physics of carbon nanotubes, nanotube geometrical and electronic structure, and current nanotube research.

EEE 6460: Advanced Microsystem Technology (3) *Prereq: EEL 5225.* Advanced micro-fabrication technologies, micro-system design, interface circuits, and MEMS packaging. CMOS, Optical, and RF MEMS.

EEE 6465: Design of MEMS Transducers (3) *Prereq: EEL 5225, and EEL 4331 or EEL 5331.* Design of MEMS transducer systems with physical, technological and economic constraints.

EEL 5182: State Variable Methods in Linear Systems (3) *Prereq: EEL 4657.* Linear algebra and state variable methods for design and analysis of discrete and continuous linear systems.

EEL 5225: Principles of Micro-Electro-Mechanical Transducers (3) *Prereq: EEL 3396 or consent of instructor.* Introduction to principles of micro-electro-mechanical devices and systems.

EEL 5400: Airborne Sensors and Instrumentation(3) Remote sensing problems formulated in terms of information extraction to decide what sensors and algorithms are needed for a given application.

EEL 5401: Airborne Laser Scanning: Data Processing and Analysis(3) Acquisition, processing, and analysis of laser ranging data, utilizing it for several earth science applications.

EEL 5441: Fundamentals of Photonics (3) *Prereq: EEL 3472 and 3396.* Review of electromagnetic fields and waves, energy bands in semiconductors, p-n junctions and optical properties of semiconductors. Fundamentals of optical modulators and switches, laser theory, laser characteristics, photodetectors, optical waveguides, and photonic applications.

EEL 5451L: Photonics Laboratory (2) *Prereq: EEL 4440 or 4445 or 5441.* Experiments in wave optics, acousto-optics, lasers, fiber optics, planar wave guides, and coherent optics.

EEL 5490: Lightning (3) *Prereq: EEL 3472.* Introduction to lightning discharge processes. Electromagnetics relevant to lightning measurements. Applications for determining lightning charge, current, location, and characteristics. Lightning protection.

EEL 5544: Noise in Linear Systems (3) Passage of electrical noise and signals through linear systems. Statistical representation of random signals, electrical noise, and spectra.

EEL 5546: Electronic Countermeasures(3) *Prereq: EEL 4516 or 5544.* Analysis of electronic countermeasures for radar systems.

Pulsed and spread spectrum detection; barrage, incoherent, and coherent jammers; burn through analysis; autocorrelation receiver structures.

EEL 5547: Introduction to Radar (3) *Prereq: EEL 4516 or 5544.* Basic principles of cw and pulsed radar; angle, range, and doppler tracking; accuracy and resolution; signal design.

EEL 5666C: Intelligent Machines Design Laboratory (4) *Prereq: EEL 4744C.* Design simulation, fabrication, assembly, and testing of intelligent robotic machines.

EEL 5718: Computer Communications (3) *Prereq: EEL 4514.* Design of data communication networks: modems, terminals, error control, multiplexing, message switching, and data concentration.

EEL 5764: Computer Architecture (3) *Prereq: EEL 4713C, 4744C, or equivalents.* Fundamentals in design and quantitative analysis of modern computer architecture and systems, including instruction set architecture, basic and advanced pipelining, superscalar and VLIW instruction-level parallelism, memory hierarchy, storage, and interconnects.

EEL 5840: Elements of Machine Intelligence (3) Engineering and hardware concepts pertaining to design of intelligent computer systems.

EEL 5905: Individual Work (1-4; max: 6) *Prereq: consent of adviser.* Selected problems or projects.

EEL 5934: Special Topics in Electrical Engineering (1-3; max: 8)

EEL 6264: Advanced Electric Energy Systems I (3) *Prereq: consent of instructor.* Energy systems planning and operation with emphasis on advanced analysis methodologies and computer simulation.

EEL 6265: Advanced Electric Energy Systems II (3) *Prereq: EEL 6264.* Continuation of EEL 6264 with additional emphasis given to the new electric energy technologies.

EEL 6443: Integrated and Fiber Optics (3) *Prereq: EEL 5441.* Review of electromagnetic waves. Dielectric interfaces, propagation in graded-index media, slab waveguides, coupled waveguides, waveguide fabrication and characterization.

EEL 6447: Laser Electronics (3) *Prereq: EEL 3473 and 5441 or equivalent.* Study of lasers from basic principles to operational characteristics.

EEL 6486: Electromagnetic Field Theory and Applications I (3) *Prereq: undergraduate course in fields and waves.* Advanced electrostatics, magnetostatics, time-varying electromagnetic fields, wave propagation, waveguides.

EEL 6487: Electromagnetic Field Theory and Applications II (3) *Prereq: EEL 6486.* Electromagnetic radiation, antennas, wave propagation in anisotropic media.

EEL 6502: Adaptive Signal Processing (3) *Prereq: EEL 5701, 5544.* Theory of adaptation with stationary signals; performance measures. LMS, RLS algorithms. Implementation issues and applications.

EEL 6503: Spread Spectrum (3) *Prereq: EEL 5544 and 6535.*

Techniques and applications; spreading sequence design; code division multiple access; multi-user detection.

EEL 6507: Queuing Theory and Data Communications (3) *Prereq: EEL 5544.* Introduction to basic queuing models; performance analysis of multiple access protocols; error control strategies.

EEL 6509: Wireless Communication (3) *Prereq: EEL 5544.* Introduction. Satellite and cellular systems, propagation, modulation techniques, multiple access techniques, channel coding, speech and video coding, and wireless computer networks.

EEL 6527: Digital Filtering (3) *Prereq: analysis and design of digital filters.* Introduction to number transforms, complexity of algorithms, and finite fields. Development of transforms and digital filter using algebraic operators and finite fields plus the technological consideration of DSP system and system integration.

EEL 6532: Information Theory (3) *Prereq: EEL 5544 or equivalent.* Applications of information theory to communications and other releated areas.

EEL 6533: Statistical Decision Theory (3) *Prereq: EEL 5544.* Hypothesis testing of signals in the presence of noise by Bayes, Neyman-Pearson, minimax criteria; estimation of signal parameters.

EEL 6535: Digital Communications (3) *Prereq: EEL 5544.* Digital modulation techniques; analysis of digital communication systems in presence of noise; optimum principles; synchronization; equalization.

EEL 6537: Spectral Estimation (3) *Prereq: EEL 5544, 5701.* Measurement and analysis of signals and noise. Digital filtering and spectral analysis; fast Fourier transform.

EEL 6550: Error Correction Coding (3) *Prereq: EEL 5544 or equivalent. Coreq: EEL 5544 or 4516.* Introduction to abstract algebra, block coding and decoding, convolutional coding and decoding, trellis coded modulation, and run-length-limited codes.

EEL 6562: Image Processing and Computer Vision (3) Pictorial data representation; feature encoding; spatial filtering; image enhancement; image segmentation; cluster seeking; two-dimensional z-transforms; scene analysis; picture description language; object recognition; pictorial database; interactive graphics; picture understanding machine.

EEL 6586: Automatic Speech Processing (3) *Prereq: EEL 5701.* Various models of speech production and perception. Operation of speech synthesizers. Discussion of speech recognition. Mathematical models of speech signals.

EEL 6591: Wireless Networks(3) *Prereq: EEL 5718 and knowledge of probability and statistics.* Design and analysis of wireless networks including channel characteristics, physical layer, cellular concepts, multiple access control protocols, FEC and ARQ protocols, resource allocation, and wireless standards.

EEL 6614: Modern Control Theory (3) *Prereq: EEL 5182.* Optimization of systems using the calculus of variations, dynamic programming, and the maximum principle. Extensive study of the linear plant with a quadratic performance index. Observers and

dynamic compensators.

EEL 6617: Linear Multivariable Control (3) *Prereq: MAS 4105, EEL 5182.* Transfer matrix theory of systems, emphasis on feedback, internal stability, model matching, and assignment of invariant factors.

EEL 6619: Robust Control Systems (3) *Prereq: EEL 5182.* Analysis and design of multivariable control systems in presence of uncertainties.

EEL 6706: Fault-Tolerant Computer Architecture (3) *Prereq: EEL 5764 or CDA 5155.* Design and quantitative analysis of fault-tolerant architectures and dependable systems including fundamental issues, redundancy techniques, evaluation methods, design methodology, and applications.

EEL 6763: Parallel Computer Architecture (3) *Prereq: EEL 5764.* Advanced architecture emphasizing design and quantitative analysis of parallel architecture and systems, including theory, hardware technologies, parallel and scalable architectures, and software constructs.

EEL 6769: Hardware-Software Interactions: Nonnumeric Processing (3) *Prereq: EEL 6767 or COP 5725 or consent of instructor.* Information representations; content and context search methods; associative memories, retrieval language mapping; parallel processing; hardware and software garbage collections.

EEL 6785: High-Performance Computer Networks (3) *Prereq: EEL 5718 or CEN 6505.* Design and quantitative analysis of high-speed networks and interconnects including protocols, hardware and software interfaces, switching, light-weight communication layers, flow and error control, and quality of service.

EEL 6814: Neural Networks for Signal Processing (3) *Prereq: EEL 6502.* Optimal filters in vector spaces. Linear machines and discriminant functions. Gradient descent learning in additive neural model. Performance measures of multilayer perceptions and Hopfield. Dynamic neural networks and issues of short term memory; unsupervised learning; feature extraction, data reduction; potential functions; syntactic pattern description; recognition grammars; machine intelligence.

EEL 6825: Pattern Recognition and Intelligent Systems (3) Decision functions; optimum decision criteria; training algorithms; unsupervised learning; feature extraction, data reduction; potential functions; syntactic pattern description; recognition grammars; machine intelligence.

EEL 6841: Machine Intelligence and Synthesis (3) *Prereq: EEL 5840.* Theory of machine intelligence applied to general problem of engineering intelligent computer systems and architecture. Applications emphasized.

EEL 6892: Virtual Computers (3) *Prereq: EEL 5764 or COP 5615 or equivalent.* Techniques for virtualization of networked computer systems. Virtual machines (classic VMs, application binary interface VMs, para-virtualization), virtual distributed file systems (file system proxies, call-forwarding), and virtual networks (tunneling, virtual private networks).

EEL 6905: Individual Work (1-4; max: 6) *Prereq: consent of adviser.* Selected problems or projects.
EEL 6910: Supervised Research (1-5; max: 5) S/U.
EEL 6935: Special Topics in Electrical Engineering (1-4; max: 12, including EEL 5905 and EEL 6905)
EEL 6940: Supervised Teaching (1-5; max: 5) S/U.
EEL 6971: Research for Master's Thesis (1-15) S/U.
EEL 6972: Research for Engineer's Thesis (1-15) S/U.
EEL 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
EEL 7980: Research for Doctoral Dissertation (1-15) S/U.

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Engineering--General

College of Engineering

Dean: C. R. Abernathy.

EGN 5949: Practicum / Internship / Cooperative Work Experience (1-6; max: 6) *Prereq: graduate student.* Practical cooperative engineering work under approved industrial and faculty supervision. S/U.

EGN 6640: Entrepreneurship for Engineers (3) Introduction to entrepreneurship, idea generating and feasibility analysis, and business planning. Lectures, case studies, student-led discussions, team business plans, and investor presentations.

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English

College of Liberal Arts and Sciences

Graduate Faculty

Chair: P. K. Gilbert. *Graduate Coordinator:* P. E. Wegner. *Assistant Graduate Coordinator:* M. J. Schueller. *Complete faculty listing by department*: Follow this link

The Department of English offers the Master of Arts degree (thesis and nonthesis options) and the Doctor of Philosophy degree in English with the specializations listed below, and the Master of Fine Arts degree in creative writing. Complete descriptions of the minimum requirements for the M.A., M.F.A., and Ph.D. degrees are provided in the *General Information* section of this catalog.

Specific areas of specialization for the Master of Arts and the Doctor of Philosophy include literature (Medieval, Renaissance, Restoration, and 18th-century and 19th-century British literature, American literature to 1900, contemporary British and American literature), American studies, critical theory, cultural studies, film and media studies, feminisms, genders and sexualities, postcolonial studies, composition and rhetoric, comics and visual rhetoric, and children's literature.

New graduate students should have completed an undergraduate English major of at least 24 semester hours, and doctoral students should have a Master of Arts degree in English. Full information concerning courses of study is available from the graduate coordinator.

AML 6017: Studies in American Literature Before 1900 (3;

max: 12)
AML 6027: Studies in 20th-Century American Literature (3; max: 12)
CRW 6130: Fiction Writing (3; max: 12)
CRW 6166: Studies in Literary Form (3; max: 12) *Prereq: consent of instructor.* Formal aspects of literature.
CRW 6331: Verse Writing (3; max: 12)
CRW 6906: Individual Work (1-3; max: 12) Individual study in reading literature and criticism, required for MFA specialization in creative writing.
ENC 5236: Advanced Business Writing for Accounting (4) Practice in and examination of theories of professional writing.
ENC 6428: Digital English (3; max: 12) Digital technologies, media, and programs related to the discipline of English. Scholarship and theory about (and production of work in) such media (web, MOO).
ENG 6016: Psychological Approaches to Literature (3; max: 6)
ENG 6075: Literary Theory: Issues (3; max: 12)
ENG 6076: Literary Theory: Theorists (3; max: 12)
ENG 6077: Literary Theory: Forms (3; max: 12) Forms of theory studies (e.g., "schools," writing practices, assemblages of theoretical issues).
ENG 6137: The Language of Film (3; max: 12)
ENG 6138: Studies in the Movies (3; max: 12)
ENG 6906: Individual Work (1-3; max: 12)
ENG 6910: Supervised Research (1-5; max: 5) S/U.
ENG 6971: Research for Master's Thesis (1-15) S/U.
ENG 7939: Seminar in Variable Topics (1-5; max: 12)
ENG 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
ENG 7980: Research for Doctoral Dissertation (1-15) S/U.
ENL 6206: Studies in Old English (3; max: 12)
ENL 6216: Studies in Middle English (3; max: 12)
ENL 6226: Studies in Renaissance Literature (3; max: 12)
ENL 6236: Studies in Restoration and 18th-Century Literature (3; max: 12)
ENL 6246: Studies in Romantic Literature (3; max: 12)
ENL 6256: Studies in Victorian Literature (3; max: 12)
ENL 6276: Studies in 20th-Century British Literature (3; max: 12)
LAE 6940: Supervised Teaching (1-5; max: 5) S/U.
LAE 6947: Writing Theories & Practices (3; max: 6) *Prereq: English major.*
LIT 5335: Approaches to Children's and Adolescent Literature (3; max: 6) *Prereq: at least 1 upper-division survey in children's or adolescent literature.* Exploration of controversies, trends, and critical problems.
LIT 6037: Studies in Verse (3; max: 12)

LIT 6047: Studies in Drama (3; max: 12)
LIT 6236: Postcolonial Studies (3; max: 09) Postcolonial literature and theory, including theories of colonialism and globalization, as well as the literature of Africa, Asia, the Caribbean, Australia, New Zealand, and Canada as they pertain to colonialism and its legacies.
LIT 6308: Studies in Comics and Animation (3; max: 12) Explores comics and comics theory, including intersections with visual rhetoric in graphic novels, manga, anime, animation, and other forms, from a variety of theoretical approaches.
LIT 6309: Communications and Popular Culture (3) Study of the origins and qualities of the popular arts in modern society.
LIT 6327: Studies in Folklore(3; max: 12)
LIT 6357: African-Amer. or African Diaspora Lit./Cultures (3; max: 12)
LIT 6358: Theoretical Approaches to Black Cultural Studies (3; max: 9) Explorations of theory and black writing and the variety of theoretical approaches.
LIT 6855: Issues in Cultural Studies (3; max: 12)
LIT 6856: Cultural Studies: Interventions (3; max: 12) Praxes, perspectives, and limitations of cultural and theoretical studies within the multiple contexts of their production.
LIT 6857: Cultural Studies: Movements (3; max: 12) Theories and histories of cultural groups, classification, or communities in various media.
LIT 6934: Variable Topics (1-5; max: 12) Studies in topics not normally offered in the regular curriculum, including intensive study of topics within a literary period, extensive study of motifs crossing several periods, and studies in various national or ethnic literatures (African, Afro-American, Jewish, Scots).
SPC 6239: Studies in Rhetorical Theory (3; max: 9) Examination of ancient, medieval, renaissance, and modern writers who have influenced rhetorical thought, criticism, speaking, and writing.

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Entomology and Nematology

College of Agricultural and Life Sciences

Graduate Faculty

Chair: J. L. Capinera. *Graduate Coordinator:* H. J. McAuslane.
Complete faculty listing by department: Follow this link

The Entomology and Nematology Department offers the Master of Science (thesis and nonthesis options) and Doctor of Philosophy degrees in entomology and nematology with the following specializations: entomology, nematology, and pest management. Minimum requirements for the M.S. and Ph.D. degrees are described in the *General Information* section of this catalog. The Department also offers a cooperative Doctor of Philosophy degree with Florida A&M University and distance education courses leading to the M.S. degree. Members of the Graduate Faculty include the department resident faculty, faculty located on University of Florida campuses away from Gainesville, scientists with other State of Florida agencies such as the Division of Plant Industry and Florida Department of Agriculture and Consumer Services, and scientists of the U.S. Department of Agriculture. The Graduate Faculty is qualified to direct graduate students in all specialties of entomology, nematology, and acarology. New graduate students should have backgrounds in biology, chemistry, physics, and mathematics. Minor deficiencies may be made up after entering graduate school. The Department offers a combined bachelor's/master's degree program. Contact the graduate coordinator for information.

ALS 5136: Agricultural Ecology Principles and Applications (3)
Introduction to agroecosystems. Ecological principles with examples and applications from agriculture.

ALS 6046: Grant Writing (2) *Prereq: admitted to doctoral program.* Preparation, submission, and management of competitive grants, including operations of national review panels and finding sources of extramural funding.

ALS 6166: Exotic Species and Biosecurity Issues (3) *Prereq: BSC2010, BSC2010L, BSC2011, BSC2011L, or equivalent.* U.S. policies and programs affecting agricultural biosecurity, Attention is devoted to current agricultural and extension and regulatory programs. Emphasizes policies and procedures in detecting and reporting non-indigenous species. Students will develop the analytical capabilities to assess the consequences of agricultural biosecurity threats.

ALS 6935: Topics in Biological Invasions (3) *Prereq: BSC2010/BSC2010L and BSC2011/BSC2011L or equivalent.* Non-native species invasions and environmental effects of these invaders. Students will develop analytical capabilities to assess the consequences of biological invasions.

ENY 5006: Graduate Survey of Entomology (2) *Coreq: ENY 5006L.* Insect structure, function, development, classification, ecological niches, and control of those harmful to plants and animals.

ENY 5006L: Graduate Survey of Entomology Laboratory(1) *Coreq: ENY 5006.* Practical experience working with insects, using laboratory equipment, dissecting insects, and preparing laboratory reports. Collection required.

ENY 5031C: Insect Field Biology (3) *For nonmajors.* Role of insects in nature. Field exercises and experiments.

ENY 5151C: Techniques in Insect Systematics (2) *Prereq: ENY 3005C.* Procedures and techniques used to study systematics of insects and related organisms.

ENY 5160C: Survey of Science with Insects(3) Interactions of insects with man and environment.

ENY 5164: Graduate Survey of Invertebrate Field Biology(3) Field-oriented survey of invertebrate biodiversity and conservation.

ENY 5212: Insects and Wildlife (3) *Prereq: ENY 5006L or equivalent* Insects and other arthropods and their relationships with wild vertebrate animals.

ENY 5223C: Biology and Identification of Urban Pests (3) Biology, behavior, identification. Damage recognition of species that infest houses, damage structures, and affect pets and humans.

ENY 5226C: Principles of Urban Pest Management (3) Methods of controlling household, structural, and occasional pests. Chemical and nonchemical control of cockroaches, termites, and fleas.

ENY 5228: Graduate Survey of Urban Vertebrate Pest Management(2) Biology, ecology, health risks, exclusion, and control of vertebrate pests in urban environment.

ENY 5236: Insect Pest and Vector Management (3) Principles and practices used in pest management, emphasizing arthropod pests affecting crop and ornamental plants, humans, and livestock.

ENY 5241: Biological Control (4) Principles involved in the natural and biological control of insects.

ENY 5245: Agricultural Acarology(2) Introduction to mites of agricultural importance, their biology, behavior, and control.
ENY 5566: Tropical Entomology (3) Natural history, ecology, behavior, natural ecosystems, and agroecosystems of tropics.
ENY 5567: Tropical Entomology Field Laboratory (2) *Prereq: ENY 5566.* Field experience observing the natural history, ecology, and behavior of insects in natural ecosystems and agroecosystems in the tropics.
ENY 5611: Immature Insects (4) Structure and identification of immature forms of insects, especially the Holometabola.
ENY 5820: Insect Molecular Genetics(3) Basics of DNA, RNA, gene transcription and translation, and tools used in molecular genetics of insects.
ENY 6166: Insect Classification (3) Classification of adult insects to family and of some to species level. Habitat, niche, and relationship to environment.
ENY 6203: Insect Ecology (3) *Coreq: ENY 6203L* Advanced course on concepts in ecology with emphasis in insects; relationships with their biotic and physical environments and basics of ecological research.
ENY 6203L: Insect Ecology Laboratory(1) *Coreq: ENY 6203* Methodology and instrumentation used in ecological research with insects.
ENY 6209: Insect Chemical Ecology (3) *Prereq: BCH 3023 or CHM 2210-2211 and ENY 3005C.* Analyze various forms of chemical communication used by insects for survival; emphasizes using these systems to control pest species.
ENY 6248: Termite Biology and Control (2) Taxonomy, identification, behavior, ecology, and methods of control for the economically important termites of the New World.
ENY 6401C: Insect Physiology (4) Physiology and biochemistry of insect development and adaptation for survival.
ENY 6454: Behavioral Ecology and Systematics of Insects (3) A theoretical and practical treatment of behavioral ecology and how phylogenetic methods can be employed to both develop and test hypotheses of how insect behavior has evolved.
ENY 6651C: Insect Toxicology (3) Chemistry, toxicity, mode of action, metabolism, and environmental considerations of insecticides and related compounds. Mechanisms of resistance to insecticides.
ENY 6665: Advanced Medical and Veterinary Entomology I (3) *Coreq: ENY 6665L.* Taxonomy, morphology, and biology of arthropods of medical and veterinary importance. A collection and project proposal will be required.
ENY 6665L: Advanced Medical and Veterinary Entomology Laboratory (1) *Coreq: ENY 6665.* Identification of mosquitoes, ticks, lice, fleas, and other disease vectors. Collection required.
ENY 6706: Forensic Entomology(2) The role of arthropods in decomposition, in criminal and civil investigations and the increasing importance of science on society. The material discussed in this course deals with death and some may consider images and concepts disturbing.

ENY 6706l: Forensic Entomology Laboratory (1) *Coreq: ENY 6706* Laboratory and field experiments designed to accompany ENY 6706 that will involve decomposing pig carcasses or other applied forensic applications.
ENY 6821: Insect Pathology (4) *Prereq: consent of instructor.* Interrelationship of insects and pathogenic micro-organisms; history, classification, morphology, mode-of-action, and epidemiology of entomogenous bacteria, viruses, protozoa, and fungi.
ENY 6822C: Molecular Biology Techniques with Invertebrates and Their Pathogens (4) *Prereq: basic course in genetics, biochemistry, or molecular biology.* Insects, nematodes, bacteria, viruses. Cloning of DNA, DNA blots, PCR, sequencing and analysis.
ENY 6905: Problems in Entomology (1-4; max: 12) Individual study under faculty guidance. Student and instructor to agree on problem and credits prior to registration.
ENY 6910: Supervised Research (1-5; max: 5) Research for nonthesis M.S. students. S/U.
ENY 6931: Entomology Seminar(1; max: 8) Presentation and discussion of current research topics. S/U option.
ENY 6932: Special Topics in Entomology (1-2; max: 4) Reports and discussions on selected topics announced in advance. S/U.
ENY 6934: Selected Studies in Entomology (1-4; max: 8) Current issues. Subject matter variable, may be repeated with different subject each time.
ENY 6940: Supervised Teaching (1-5; max: 5) S/U.
ENY 6942: Insect Diagnostics(1-3; max: 6) Identifying insects and diagnosing plant damage caused by insects. .
ENY 6943: Entomology Internship(1-3; max: 6) Diagnosing plant disorders caused by complex of insects and other factors. S/U.
ENY 6944: Entomology Extension Internship(1-3; max: 6) Diagnosing insect damage to plants in field and greenhouse. Learning to make control recommendations. S/U.
ENY 6971: Research for Master's Thesis (1-15) S/U.
ENY 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
ENY 7980: Research for Doctoral Dissertation (1-15) S/U.
NEM 5002C: Graduate Survey of Nematology (3) Morphology, anatomy, development, feeding habits, life cycles, disease cycles, and control of nematodes that parasitize plants and animals. Role of plant parasitic nematodes in disease complexes and as vectors of plant viruses. "Free-living" nematodes that inhabit oceans, fresh water, and soil.
NEM 5707C: Plant Nematology (3) Identification of plant parasitic nematodes, diseases they cause, interactions with other plant parasites, and management schemes to control population densities.
NEM 6101C: Nematode Morphology and Anatomy (2) Morphology, anatomy, and function of structures, organs, and

systems.

NEM 6102C: Nematode Taxonomy and Systematics (3) *Prereq: NEM 6101C.* Collection, preparation, and identification of plant and soil nematodes; review of pertinent literature; drawing techniques and preparation of keys.

NEM 6103: Insect Parasitic Nematodes(1) Insect-parasitic nematodes in all taxons, including their pathogenicity, life cycles, etc. Steinernematidae and Heterohibditidae emphasized.

NEM 6104L: Insect Parasitic Nematodes Laboratory(1) *Coreq: NEM 6103.* Field survey and pathogenicity experiments, survival mechanisms determined, selected nematodes produced in vivo, and DNA extracted and sequenced.

NEM 6201: Nematode Ecology (3) Population and community ecology of plant-parasitic and other soil-inhabiting nematodes. Mathematical descriptions and relationships will be emphasized where appropriate.

NEM 6708: Field Plant Nematology (2; max: 4) Field trips to various agricultural research stations and production areas in Florida to learn plant symptoms and current research methods.

NEM 6905: Problems in Nematology (1-4; max: 8)

NEM 6931: Nematology Seminar (1; max: 6) Presentation and discussion of current research, research topics. S/U option.

NEM 6932: Special Topics in Nematology (1-4; max: 4) Reports and discussions. S/U.

NEM 6934: Selected Studies in Nematology (1-4; max: 4) Current issues with subject matter variable.

NEM 6940: Supervised Teaching (1-5; max: 5) S/U.

NEM 6942: Nematode Diagnostics(2) Diagnosing nematode problems from soil and plant samples.

NEM 6943: Nematode Internship(1-3; max: 6) Diagnosing complex plant disorders caused by nematodes and other factors. S/U.

NEM 6944: Nematode Extension Internship(1-3; max: 6) Diagnosing nematode damage to plants in field or greenhouse. S/U.

NEM 6971: Research for Master's Thesis (1-15) S/U.

NEM 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

NEM 7980: Research for Doctoral Dissertation (1-15) S/U.

PMA 5205: Citrus Pest Management (3) Arthropod and nematode pests of citrus. Ecological principles of host and pest community relationships. Pest identification, biology, and interactions with citrus. Pest monitoring, diagnosis, and management.

PMA 6228: Field Techniques in Integrated Pest Management (2) Practical aspects of pest management, emphasizing sampling, diagnostics, decision making processes, and informational resources available to IPM practitioner.

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Environmental and Land Use Law

Fredric G. Levin College of Law

Director and Graduate Coordinator: Alyson Flournoy

Florida's sensitive, varied and beautiful natural environment makes the University of Florida a natural choice for students who want to focus on the national and global issues of land use and environmental law. Florida provides a perfect setting to study first-hand the efforts to reconcile growth and conservation.

The Environmental and Land Use Law Program educates future lawyers through an innovative approach that combines the study of land use law with environmental law. Many environmental problems result from inappropriate uses of land. Air and water pollution, toxic and hazardous waste, endangered species protection and balancing public health and environmental values against the protection of private property interests are challenges that face every community.

The University of Florida Levin College of Law offers a Masters (LL.M.) in Environmental and Land Use Law. This one-year post-J.D. degree provides an opportunity for experienced attorneys as well as recent law school graduates to spend an academic year full-time on the UF campus developing in-depth expertise in environmental and land use law.

Students admitted to the program work with the LL.M. Program Director to design an individual course of study tailored to their particular interests. LL.M. students are eligible to participate in the Conservation Clinic and to apply for a seat in the Summer Environmental Law Study Abroad Program in Costa Rica.

The LL.M. program adopts an innovative approach that combines the study of land use law with environmental law. Many environmental problems result from inappropriate uses of land. Air and water pollution, disposal and clean-up of hazardous waste, endangered species protection and balancing public health and environmental values against the protection of private property interests are challenges that face every community. Issues such as climate change and fresh water shortages are environmental problems with significant land use dimensions.

The program also capitalizes on the many outstanding programs at the University of Florida in disciplines related to environmental and land use law practice, including wildlife ecology, environmental engineering, urban and regional planning, and interdisciplinary ecology. The UF LL.M. program is unique in requiring that 6 of the 26 required credit hours must be from relevant courses that have substantial non-law content and are offered outside the law school or jointly by the law school and another department. In addition to completing required coursework, LL.M. candidates must complete a written project in connection with a seminar or the Conservation Clinic.

For more information about the Environmental and Land Use Law Program, contact:

University of Florida
Levin College of Law
P.O. Box 117625
Gainesville, FL 32611-7625
Phone: 352-273-0777
E-mail: elulp@law.ufl.edu

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Environmental Engineering Sciences

College of Engineering

Graduate Faculty

Chair: J. Heaney. *Graduate Coordinator:* D. W. Mazyck. *Complete faculty listing by department*: Follow this link

Graduate study is offered leading to the degrees Master of Engineering, Master of Science, Engineer, and Doctor of Philosophy in the field of environmental engineering sciences. Minimum Requirements for these degrees are given in the *General Information* section of this catalog. Our seven general graduate research and education areas are

--**Air resources:** air pollution control, air quality, and atmospheric chemistry.

--**Biogeochemical systems:** environmental biogeochemistry, environmental health, environmental toxicology, water chemistry, and sustainability engineering and industrial ecology.

--**Ecological systems:** ecological engineering; systems ecology; and wetlands, aquatic, and estuarine ecology.

--**Solid and hazardous waste management:** landfill science and engineering; waste prevention, reduction, and recycling; management of special wastes; and treatment of contaminated soil.

--**Water resources:** contaminant transport and fate, decision support systems, ecohydrology and hydrologic restoration,

hydrology, stormwater, and water resources management.

--**Water supply, wastewater, and storm water systems:** biological treatment of potable water and wastewater; collection systems; physico-chemical treatment of potable water, wastewater, and stormwater; reuse; and water conservation.

--**Environmental nanotechnology:** aerosols and environmental toxicology.

Graduate students can also combine one or more of the above areas with specialties in other departments at the University of Florida.

The department participates in the hydrologic sciences interdisciplinary concentration that is offered through 9 departments in 3 colleges. This concentration is described under Interdisciplinary Graduate Studies.

Direct admission into the Master of Science and Doctor of Philosophy programs requires a bachelor's degree in engineering or in a basic science such as chemistry, geology, physics, biology, or mathematics. Persons with a degree in a nontechnical field may also be admitted into this program after completing appropriate technical courses. Direct admission into the Master of Engineering program requires a bachelor's degree in engineering.

Requirements for a master's degree normally take 12 to 24 months to complete. The length of time required for the Doctor of Philosophy degree depends partly on the research topic, and may be completed in 3 years, but often takes longer, depending on prior academic experience. The following courses in related areas will be acceptable for graduate credit as part of the candidate's major:

Systems Ecology and Energy Analysis

--AWB 6453
--BOT 5695
--GLY 5827
--PCB 5307C, 6356C, 6447C, 6496C
--URP 6231, 6821.

Concurrent program: The department offers a combined bachelor's/master's degree program. This program allows qualified students to earn both a bachelor's degree and a master's degree, with a savings of 12 credits.

Joint program: The Environmental Engineering Sciences Department, in partnership with the Levin College of Law, offers a joint program leading to the M.S. or M.E. degree in environmental engineering sciences and the Juris Doctor degree. Twelve credits of

appropriate course work are counted toward both degrees.

CEG 5206: Geosensing I (3) *Prereq: consent of instructor.* History of geodetic science as applied to earth's shape, local and world reference frames, gravity and anomalies, geoid, satellite geodesy and GPS, geodetic positioning, and navigation by satellite technology.

CWR 6115: Surface Hydrology (3) *Prereq: MAP 2302, CWR 3201, or EGN 3353C.* Occurrence and distribution of water by natural processes including atmospheric thermodynamics, precipitation, runoff, infiltration, water losses, flood routing and catchment characteristics, analysis, and methods of runoff prediction. Current hydrologic computer models.

CWR 6252: Environmental Biochemistry of Trace Metals (3) *Prereq: consent of instructor.* Environmental impact and fate of trace metals and metalloids as they cycle through geological and biological environmental compartments. Emphasizes anthropogenic activities of metals with growing environmental concerns, including arsenic, mercury, chromium, and lead.

EES 5105: Advanced Wastewater Microbiology (3) *Prereq: consent of instructor.* The role of microorganisms and other biota in major environmental problems, wastewater processes, and natural bodies of water.

EES 5107: Ecological and Biological Systems(3) System dynamics, fundamental microbiological principles, and general ecological principles and structure and function of ecosystems.

EES 5207: Environmental Chemistry (3) *Prereq: CHM 2046.* Survey of principles of chemistry with applications to water, emphasizing properties, composition, redox equilibria, and complexation; environmental organic chemistry; earth's atmosphere with emphasis on chemical composition, gaseous inorganic pollutants and oxides, and photochemical smog.

EES 5245: Water Quality Analysis (3) *Prereq: CHM 2046, EES 4201, or 6208, or consent of instructor.* Applying the principles of analytical chemistry to determine the chemical composition of natural waters and wastewaters. Emphasizes methods used routinely to determine water and wastewater quality and to interpret data.

EES 5305C: Ecological and General Systems (3) *Prereq: MAP 2302 or equivalent.* Systems ecology, including examples, languages, theoretical formulations, and models for designing, synthesizing, and predicting systems of man and nature.

EES 5306: Energy Analysis (3) Energetics of systems of environment and economics; energy analysis of environmental systems, agroecosystems, regional and national economies; energy evaluation of public policy.

EES 5307: Ecological Engineering (3) Principles and practices in designing and managing the environment with society. Systems concepts for organizing humanity, technology, and nature.

EES 5315: Ecology and the Environment (2) Applying ecological principles to environmental problems and management.

EES 5415: Environmental Health (3) Effects of environment pollution on health. Methods of evaluating, treating, and preventing pollutants of health significance.

EES 6007: Advanced Energy and Environment (3) Energy basis for a system of humanity and nature, including principles of systems ecology, ecological economics, and public policy.

EES 6009: Ecological Economics (2) Examines new research areas; models and mathematical theories common to ecology and economics, interfaces between ecology and economics, and relationships of energy and money.

EES 6026C: Environmental Systems Dynamics (3) *Prereq: CGS 2425 or equivalent.* Feedback principles and methods introduced and used to develop and test hypotheses of causes of dynamics in environmental systems. Hypotheses tested through computer modeling.

EES 6028: Spatial Modeling Using Geographic Information Systems (3) Advanced applications of GIS and principles of spatial analysis and modeling in environmental engineering sciences.

EES 6051: Advanced Environmental Planning and Design (3) Sustainable communities and regions. Quantitative methods for evaluating environmental impacts and carrying capacity. Theories of spatial and temporal organization of systems of humanity and nature.

EES 6135: Aquatic Microbiology (3) Behavior of microorganisms in freshwater, marine and soil environments. Stress of pollution on microbial communities. Adsorption of microorganisms to surfaces.

EES 6136: Aquatic Autotrophs (3) The function of algae and macrophytes in lake systems. Environmental problems associated with excessive growth of algae and macrophytes, and methods for their control.

EES 6137: Aquatic Heterotrophs (3) The role of zooplankton, benthic invertebrates, and fish in freshwater systems. Emphasizes trophic-level interactions, nutrient cycling, and the potential of each group for predicting water quality.

EES 6140: Biology of Exotic Species (3) *Prereq: EES 4103.* Examines case histories of species' introduction worldwide and the mechanisms responsible for establishment and dominance of native communities by exotic taxa.

EES 6145: Environmental Meteorology and Oceanography (3) *Prereq: MAP 2302 and PHY 2049.* Principles of meteorology and oceanography and interactions of atmosphere and oceans with human economy.

EES 6208: Principles of Water Chemistry I (3) *Prereq: CHM 2046 or consent of instructor.* Applying chemical principles to aqueous reactions. Emphasizes thermodynamics, kinetics, and aqueous equilibria including acid-base, solubility, complexation, precipitation, and redox.

EES 6209: Principles of Water Chemistry II (3) *Prereq: EES 4201 or 6208, or consent of instructor.* Application of chemical principles to reactions and composition of natural waters; emphasis on organic compounds, chemical models, and fate of organic

contaminants.

EES 6225: Atmospheric Chemistry(3) *Prereq: ENV 4101 or consent of instructor.* Nature, sources, and sinks of fixed and variable constituents of atmosphere. Chemical changes occurring. Influences and properties of atmospheric components of natural and anthropogenic origin.

EES 6246: Advanced Water Analysis (3) *Prereq: EES 4200, 5245, or consent of instructor.* Advanced chemical procedures used in water chemistry research. Applying instrumental methods for determining trace inorganic and organic natural water constituents.

EES 6301: Comparative Approaches in Systems Ecology (3) Alternative approaches for understanding ecological interactions. Prediction after ecosystem perturbations and optimal design with nature are evaluated in the context of natural selection and thermodynamics. Static, dynamic, deterministic, and stochastic study of energy flow, element cycling, and information feedback.

EES 6308C: Wetland Ecology (3) *Prereq: BSC 2005 or EES 4103.* Defining and classifying major wetland ecosystems, formation of wetlands, wetland functions and values; wetlands ecological engineering and management; and integrating wetlands into developing landscape. Emphasizes everal field trips to natural and altered wetlands.

EES 6318: Principles of Industrial Ecology(3) Linkage of industry activity with environmental and social sciences. Corporate environmental management and environmental ethics. Resources, laws, and economics. Environmental accounting. Industrial products and processes, and life cycle assessments. Case studies of corporate environmental policies.

EES 6356: Estuarine Systems (3) Coastal ecosystems: their components, processes, systems, models, and management including tropical, arctic, and man-affected types. Field trip and literature review.

EES 6405: Environmental Toxicology (3) *Prereq: BSC 2005 or EES 4102, or consent of instructor.* Effects of environmental toxicants on humans, animals, and the environment.

ENG 6433: Activated Carbon: Environmental Design and Application (3) Theory and application of manufacturing activated carbon, its use in water treatment/remediation (i.e., design of activated carbon systems), and thermal reactivation.

ENV 5072: Pollution Control and Prevention (3) *Prereq: CHM 2046, PHY 2005.* Survey of engineering processes used to control pollutants in four environmental engineering systems: water, air, waste, and radioactive materials. Pollution prevention for a sustainable environment.

ENV 5075: Environmental Policy (3) Policy analysis, making, and implementation. Analytical methods for evaluating alternative policies. Legal, social, political, and economic patterns and processes that shape the climate in which environmental policy is made.

ENV 5105: Foundations of Air Pollution (3) Principal types, sources, dispersion, effects, and physical, economic and legal

aspects of control of atmospheric pollutants.

ENV 5305: Advanced Solid Waste Treatment Design (3) Review of solid and hazardous waste treatment processes, including thermal, biological, chemical, and mechanical treatment. Analysis of existing operations.

ENV 5306: Municipal Refuse Disposal (3) Quantities and characteristics of municipal refuse and hazardous materials. Collection methods, transfer stations, equipment and costs. Refuse disposal practices, regional planning and equipment.

ENV 5518: Field Methods in Environmental Hydrology (3) *Prereq: CWR 5125 or equivalent.* Field methods for characterizing sites for environmental and hydrologic evaluation. Focuses on subsurface systems and ground water interactions.

ENV 5520: Fluid Flow in Environmental Systems (3) *Prereq: CHM 2046, PHY 2005.* Fundamentals of fluid flow and their relation to environmental systems such as surface water, ground water, and engineering systems.

ENV 5555: Wastewater Treatment (4) *Prereq: ENV 4514C or equivalent.* In-depth study of the physical, chemical, and biological processes used to treat wastewater. Emphasizes cause and effect of physical and biological actions.

ENV 6050: Advanced Pollutant Transport (3) *Prereq: ENV 3040, 4501, or consent of instructor.* Quantifying physical, biological, and chemical processes occurring in natural freshwater ecosystems. Mathematical analysis of the effects of conservative and nonconservative pollutant loadings to lakes and rivers. Detailed study of dissolved oxygen mass balance modeling and eutrophication.

ENV 6052: Immiscible Fluids in Porous Media (3) *Prereq: consent of instructor.* Mechanics of immiscible fluids in porous media. Static fluid distributions, and steady and unsteady multiphase flow. Remediation of sites contaminated with nonaqueous phase liquids.

ENV 6116: Air Pollution Sampling and Analysis (3) *Prereq: ENV 4101 or consent of instructor.* Determining the concentration of normally encountered ambient pollutants. Practical experience in ambient air and indoor sampling.

ENV 6126: Air Pollution Control Design (3) *Prereq: ENV 4101 or consent of instructor.* Design, analysis, operational limitations, cost and performance evaluation of control processes and equipment. Field visits to and inspection of industrial installations.

ENV 6130: Aerosol Mechanics (3) Generating, collecting, and measuring aerosols. Theory of fluid dynamic, optical, electrical, inertial, and thermal behavior of gas-borne particles.

ENV 6146: Atmospheric Dispersion Modeling (3) Predicting downwind pollutant concentrations from point, line, and areal sources.

ENV 6215: Health Physics (3) Techniques of hazard evaluation and radiation control; monitoring methods; survey techniques; biological sampling; instrument calibration; exposure standards and radiation protection regulation; on-site radiation safety surveys and

evaluation.

ENV 6216: Radioactive Wastes (3) Source, treatment, and disposal. Emphasizes preventing environmental contamination.

ENV 6301: Advanced Solid Waste Containment Design (3) Current practice in designing solid and hazardous waste landfills, waste piles, monofills, and surface impoundments. Regulations, siting, sizing, liners, leachate and gas management, operations, closure, and post-closure.

ENV 6435C: Advanced Water Treatment Process Design (4) *Prereq: CHM 2046, EES 4201 or 6208, ENV 4514C.* Designing water treatment processes including air stripping disinfection, activated carbon adsorption, ion exchange, membrane processes, and ozonation. Predesigning laboratory studies to select appropriate process parameters.

ENV 6437: Advanced Wastewater System Design (3) *Prereq: ENV 4514C or equivalent. Coreq: ENV 4561 or equivalent.* Layout and design of sanitary sewage systems, pumping stations, force mains, wastewater treatment plants, and methods of effluent disposal. Emphasizes preparing design drawings and estimating costs.

ENV 6438: Advanced Potable Water Systems Design (3) *Prereq: EES 4201 or 6208, and ENV 4514C.* Design of water treatment operations, including coagulation, flocculation, mixing, sedimentation, filtration, softening, corrosion control, and sludge management. Design costs.

ENV 6441: Water Resources Planning and Management (3) Principles and practice of water resource planning and management. Protocols used at local, state, federal, regional, and international levels. Plan formulation, evaluation, and implementation. Stakeholder involvement in planning processes. Analytical tools. Case studies.

ENV 6508: Wetland Hydrology (3) *Prereq: basic fluid flow course or consent of instructor.* Water flow and chemical transport in wetlands. Surface water and ground water interaction in wetlands. Constructed wetlands for water treatment.

ENV 6510: Groundwater Restoration (3) Designing water treatment systems using aeration, activated carbon, reverse osmosis, and in situ bioremediation to restore contaminated groundwater.

ENV 6511: Biological Wastewater Treatment (3) Theory and current research associated with biological treatment processes.

ENV 6556: Advanced Waste Treatment Operations (3) *Prereq: ENV 5555, 6511.* Biological, physical, and chemical processes used in the advanced treatment of domestic and industrial wastewater. Reuse application and guidelines.

ENV 6905: Individual Work (1-4; max: 8) Faculty-supervised individual research or study of material not covered in formal courses.

ENV 6910: Supervised Research (1-5; max: 5) S/U.

ENV 6916: Nonthesis Project (1-3; max: 3)

ENV 6932: Special Problems in Environmental Engineering (1-

4; max: 8)
ENV 6935: Graduate Environmental Engineering Seminar (1; max: 6) S/U option.
ENV 6971: Research for Master's Thesis (1-15) S/U.
ENV 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
ENV 7980: Research for Doctoral Dissertation (1-15) S/U.

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Epidemiology and Biostatistics

College of Public Health and Health Professions

Graduate Faculty

Interim Chair: E. M. Peoples-Sheps. *Graduate Coordinator:* E. M. Peoples-Sheps.
Complete faculty listing by department: Follow this link

The Department of Epidemiology and Biostatistics offers the Doctor of Philosophy degree in epidemiology (http://epidemiologyphd.health.ufl.edu/) and in biostatistics (http://epidemiologyphd.health.ufl.edu/) as well as the Master of Public Health degree, with concentrations in epidemiology and in biostatistics, which is described in detail in the Public Health secThe Department of Epidemiology and Biostatistics offers the Doctor of Philosophy degree in epidemiology (http://epidemiologyphd.health.ufl.edu/) and in biostatistics (http://epidemiologyphd.health.ufl.edu/) as well as the Master of Public Health degree, with concentrations in epidemiology and in biostatistics, which is described in detail in the Public Health section of this catalog. The Department also offers the Master of Science in Biostatistics (http://biostatistics.phhp.ufl.edu/ms/). The programs in the Department are designed to prepare students for research and faculty positions; careers in health agencies and health-related institutions; and for consultation, especially in the biomedical fields. Doctoral training programs are described under each division below.

The Department functions as a single administrative unit combining the two distinct disciplines. Although each discipline and each graduate program has a set of required courses, there is ample flexibility in the programs to allow each student to develop

strengths and interests through elective courses, seminars, and tutorials. Students can find numerous positions available on funded research projects in the Department. For more detail, see .
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The Department functions as a single administrative unit combining the two distinct disciplines. Although each discipline and each graduate program has a set of required courses, there is ample flexibility in the programs to allow each student to develop strengths and interests through elective courses, seminars, and tutorials. Students can find numerous positions available on funded research projects in the Department. For more detail, see .

PHC 6016: Social Influences in Public Health (3) *Prereq: PHC 6000, PHC 6001, PHC 6406, or consent of instructor.* Social determinants of population health, including acute and chronic disease outcomes, and health behavior. Introduces methodological approaches to the field of social epidemiology with specific attention to measurement issues.
PHC 6050C: Biostatistical Methods I(3) *Prereq: basic knowledge of data analysis, linear algebra, and calculus III, and consent of instructor.* Biostatistical data analysis using linear models; theory and practice of regression and analysis of variance in the health sciences.
PHC 6051: Biostatistical Methods II (3) *Prereq: consent of instructor and Biostatistical Methods I.* Biostatistical data analysis using generalized linear models, generalized linear mixed models, semiparametric and nonparametric regression, and neural networks; theory and practice in the health sciences.
PHC 6052: Introduction to Biostatistical Methods (3)
Introduction to the concepts and methods of biostatistical data analysis. Topics include descriptive statistics, probability, standard probability distributions, sampling distributions, point and confidence interval estimation, hypothesis testing, power and sample size estimation, one- and two-sample parametric and non-parametric methods for analyzing continuous or discrete data, and simple linear regression. SAS statistical software for data management, statistical analysis and power calculations. Required core course for students in biostatistics, environmental health, and epidemiology concentrations.
PHC 6517: Public Health Concepts in Infectious Diseases(3)
Prereq: PHC 6001 and PHC 6002. Topics and methods used in modern infectious disease epidemiology.
PHC 6xxxC: Social Epidemiology in Public Health (3) *Prereq: PHC 6001, PHC 6000, PHC 6406, or consent of instructor.* Social

determinants of population health, including acute and chronic disease outcomes. Introduces methodological approaches to the field of social epidemiology with specific attention to measurement issues.

Biostatistics

The biostatistics doctoral program requires a minimum of 90 semester credits beyond the bachelor's degree. Students must have a directly related master's degree (i.e. Master of Science in statistics or biostatistics). All students must complete a minimum of 54 credits of biostatistics/statistics course work (30 credits will typically be transferred from a Master of Science program), 6 credits of public health course work, 3 credits of a consulting requirement, 6 credits of the cognate requirement, and 21 credits of dissertation work.

All graduates of the program will be expected to be able to

--Conduct independent research in the development of new biostatistical methodology

--Engage in successful collaborations with investigators in new quantitative fields

--Write statistical methodology papers for peer-reviewed statistical and biostatistical journals

--Write collaborative papers for peer-reviewed subject matter journals

--Compete successfully for research and teaching positions in academic institutions, federal and state agencies, or private institutions

Specific course requirements are described at the program website http://biostatistics.phhp.ufl.edu/phd/.

The biostatistics masters degree (MS) requires a minimum of 36 semester credits beyond the bachelor's degree. The program is designed to facilitate students' development of a strong theoretical foundation in biostatistics, broad-based understanding of biostatistical methods, and expertise in a cognate field. A typical student will be enrolled full-time for two years. Upon successful completion of the program, graduates will be awarded an M.S. degree in biostatistics.

The principal goal of the M.S. program is to prepare highly qualified individuals for future Ph.D. training and for careers in biostatistics practice. This training is conducted in the innovative and interdisciplinary public health culture of the College, and it will

produce graduates who will help address the shortage of biostatisticians. We expect our graduates to be highly competitive in three primary settings: academic university-based settings, industry, and federal agencies that involve research and/or public health practice.

Specific course requirements are described at the program website http://biostatistics.phhp.ufl.edu/ms/.

PHC 6050: Statistical Methods for Health Sciences Research I(3) Appropriate use of data summarization and presentation of basic statistical methods, including ANOVA, nonparametric methods, inference on discrete data, inference on survival data, and regression methods for continuous, binary, and survival data. Required core course for students in public health management and policy and social and behavioral science concentrations.
PHC 6053: Regression Methods for the Health and Life Sciences (3) *Prereq: PHC 6052 or equivalent. For graduate students in fields other than statistics.* Introduction to a wide range of regression methods. Primary topics are multiple linear regression, logistic regression, and Poisson regression.
PHC 6937: Special Topics in Public Health(1-6; max: 12)
PHC 6946: Public Health Internship (1-9; max: 9) *Prereq: consent of instructor.* Fieldwork at approved site. Focus on practical application of skills in student's concentration area. S/U.
PHC 7056: Analysis of Longitudinal Data (3) *Prereq: STA 6326, STA 6327 (or equivalent), STA 6207, STA 6208 (or equivalent), and STA 6246 (or equivalent).* Likelihood-based and semiparametric methods for longitudinal data. Methods to deal with missing data in both settings.
PHC 7066: Large Sample Theory (3) *Prereq: STA 6326 and 6327 (or equivalent).* Detailed introduction to large sample theory and its application in univariate and multivariate parametric and nonparametric estimation.
PHC 7980: Research for Doctoral Dissertation (1; max: 15) S/U.
STA 5223: Applied Sample Survey Methods (3) *Prereq: STA 2023, 4322, 6126, or 6166.* Designing and analyzing sample surveys. Sources of error. Questionnaire design. Simple random, stratified, systematic, and cluster sampling. Practical application of concepts.
STA 5325: Fundamentals of Probability(3) *Prereq: grade of C or better in MAC 2313 and STA 3032 or equivalent.* Topics in probability and statistics, particularly discrete and continuous random variables, sampling distributions, estimation, and hypothesis testing. Applications to engineering and natural science.
STA 5328: Fundamentals of Statistical Theory (3) *Prereq: STA 4321 or equivalent.* Direct continuation of STA 4321/STA 5325. Basic material for distribution theory, sampling distributions, properties of estimators, hypothesis testing, linear regression analysis, and analysis of variance. A good knowledge of calculus is

helpful.

STA 5503: Categorical Data Methods (3) *Prereq: STA 3024, 3032, 4210, 4322, 6127, or 6167. Intended for graduate students not majoring in statistics.* Description and inference using proportions and odds ratios, multi-way contingency tables, logistic regression and other generalized linear models, and loglinear models applications.

STA 5701: Applied Multivariate Methods (3) *Prereq: STA 3024, 6127, 6167, or 4211. Intended for graduate students not majoring in statistics.* Review of matrix theory, univariate normal, t, chi-squared and F distributions, and multivariate normal distributions. Inference about multivariate means, Hotelling's T^2 multivariate analysis of variance, multivariate regression, and multivariate repeated measures. Inference about covariance structure, principal components, factor analysis, and canonical correlation. Multivariate classification techniques, discriminant and cluster analysis. Additional topics at the discretion of the instructor, time permitting.

STA 5715: Applied Survival Analysis (3) *Prereq: STA 6127 or 6167.* Survival analysis data methods, including Kaplan-Meier and Nelson estimators of survival, accelerated failure, proportional hazards models, and frailty and recurrent-event models.

STA 6092: Applied Statistical Practice (3) *Prereq: STA 6207, 6208.* Communication, management, and the organizational, computational, and statistical thinking skills needed for consulting in statistics. Integrating graphic and numeric computing tools, research design concepts, data summary, and statistical inference methods.

STA 6166: Statistical Methods in Research I (3) *Prereq: STA 2023 or equivalent.* Statistical methods based on t, F, and Chi^2 tests. Analysis of variance for basic experimental designs. Factorial experiments. Regression analysis and analysis of covariance.

STA 7249: Generalized Linear Models (3) *Prereq: STA 6207, 6208, 6327, 6246.* Fitting of generalized linear models, diagnostics, asymptotic theory, overdispersion, estimating equations, mixed models, generalized additive models, smoothing.

STA 7346: Statistical Inference (3) *Prereq: STA 6327.* Decision rules and risk functions. Sufficiency, Minimax, and Bayes rules for estimating location and scale parameters.

Epidemiology

The epidemiology doctoral program requires a minimum of 90 semester credits beyond the bachelor's degree. The requirements include a minimum of 12 credits in epidemiology foundation course work, which in most cases will be satisfied by a student's master's degree. It is anticipated that most students may have directly related master's degrees (i.e. Master of Science in epidemiology or Master of Public Health with a concentration in epidemiology or biostatistics). Regardless of master's degree, all students will need to demonstrate that they have successfully completed the 11 credits of foundation courses in order to take more advanced epidemiology

course work. All students must complete a minimum of 37-38 hours of epidemiology core courses, 15 credits of a concentration, 14-15 credits of general electives (which can be satisfied by master's degree course work if approved by the supervisory committee), and 12 credits of dissertation work. Students must also complete a teaching experience, which can be fulfilled via a teaching assistantship or other experience requiring college-level classroom teaching.

The University of Florida PhD program is mentor driven. All applicants are reviewed with the expectation that they will work with a primary mentor and receive graduate assistant funding to work on research projects and/or teach, if a full-time student during their course of studies.

The core course work is designed to incorporate competencies recommended in the report of the 2002 workshop on doctoral education in epidemiology from the American College of Epidemiology and Association of Schools of Public Health, and criteria for applied epidemiology competencies. The overall outcomes expected of all graduates are as follows:

1. Apply epidemiological methods to address critical and/or emerging public health issues through the use of

--Appropriate epidemiological research designs
--Advanced statistical analysis methods for health studies
--Data structures and measurement methods for health research
--Biological, behavioral and social theory applied to the understanding and prevention of contemporary threats to health and well-being
--Depth of knowledge in an area of specialization

2. Assimilate the history, philosophy, and ethical principles of epidemiology into current research

3. Develop grant proposals and manage research projects

4. Write scientific papers for publication in peer-reviewed journals, and communicate research results to scientists, policy makers, and the public

5. Compete successfully for research and teaching positions in academic institutions, federal or state agencies, or private institutions.

Specific course requirements, including biostatistical and other elective options, offered are described at the program website:(http://epidemiologyphd.health.ufl.edu/)

PHC 6000: Epidemiology Methods I (3) *Prereq: PHC 6001, 6050*

or PHC 6052, or departmental approval. Overview of epidemiology methods used in research studies that address disease patterns in community- and clinic-based populations.

PHC 6003: Epidemiology of Chronic Diseases and Disability (3) *Prereq: PHC 6001, and PHC 6052 or PHC 6050 or departmental approval.* Overview of epidemiology of chronic diseases and disabilities prevalent in various populations. Introduces contemporary methods for surveillance including risk factors, etiology, and changes over time.

PHC 6011: Epidemiology Methods II (3) *Prereq: PHC 6000 and PHC 6052, or departmental approval.* Analytic methods in epidemiology with a foundation in applied epidemiological analysis and experience in peer-review productivity based on secondary data analysis.

PHC 6014: Epidemiology, Prevention, and Control of Chronic Diseases II (3) *Prereq: PHC 6001 and 6003 or equivalent.* Survey of major chronic diseases not covered in PHC 6003. Emphasizes recent epidemiology research and findings.

PHC 6053: Regression Methods for the Health and Life Sciences (3) *Prereq: PHC 6052 or equivalent. For graduate students in fields other than statistics.* Introduction to a wide range of regression methods. Primary topics are multiple linear regression, logistic regression, and Poisson regression.

PHC 6162: Public Health Grant Writing (2) Problems encountered in the design and execution of public health population-based and intervention studies.

PHC 6405: Epidemiology of Aging (3) *Prereq: PHC 6001.* Principles and methods of epidemiology applied to aging. Examines concepts such as trends in aging and the health of aging populations, explanations and consequences of mortality decline, determinants of health and survival, and how different types of health care systems are used in prevention, intervention and treatment, and supportive care.

PHC 6711: Measurement in Epidemiology and Outcomes Research (3) *Prereq: PHC 6001 and PHC 6050 or equivalent.* Major designs and principles of measurement for epidemiology and health services outcomes research, with emphasis on use of primary data collection.

PHC 6716: Survey Research Methods (3) *Prereq: PHC 6001, 6050; and STA 6207 or equivalent, or permission of instructor.* Introduction to population surveys typical in descriptive (surveillance) and analytic epidemiology research.

PHC 6717: Theory and Methods in Public Health Disability Research (2-3; max: 3) *Prereq: PHC 6001 and PHC 6050 or equivalent.* Interplay of epidemiology, disability, and public health in America. Theoretical framework and applied research methods for disability research.

PHC 6912: Special Project: Independent Research (1-9; max: 9) *Prereq: consent of instructor.* Student must undertake significant responsibility for all or part of a research project of particular interest. S/U.

PHC 6937: Special Topics in Public Health(1-6; max: 12)
PHC 6938: Oral and Craniofacial Epidemiology (3) *Prereq: PHC 6001 and 6050 or equivalent. PHC 6000 and STA 6166 are recommended, but not required.* Introduction to epidemiology of oral and craniofacial diseases. Principles and methods of epidemiologic research in this field.
PHC 6946: Public Health Internship (1-9; max: 9) *Prereq: consent of instructor.* Fieldwork at approved site. Focus on practical application of skills in student's concentration area. S/U.
PHC 7000: Epidemiology Seminar II: Critical Evaluation, Research Proposals, and Methods (3) *Prereq: PHC 6000, 6011,and Epidemiology Seminar I.* Epidemiology and health policy research. Constructing research ideas and developing them into full proposals. Discussion of auxiliary methods based on students' planned dissertation topics.
PHC 7980: Research for Doctoral Dissertation (1; max: 15) S/U.

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Epidemiology and Health Policy Research

College of Medicine

Epidemiology (Division Director Currently Being Recruited); Health Policy/Outcomes Research (Division Director: B. Vogel); *Biostatistics (Division Director:* K. Muller) *and Biomedical Informatics (Interim Director:* M. Conlon*). Complete faculty listing by department*: Follow this link

The Department of Epidemiology and Health Policy Research offers two degrees. The first is a 36-credit-hour (including thesis) Master of Science (M.S.) program in epidemiology in the College of Medicine with concentrations in biostatistics and health policy. The second is the Doctor of Philosophy (Ph.D.) in epidemiology offered collaboratively by the Colleges of Medicine and Public Health and Health Professions.

Master of Science

Three general programs of study are available.

General epidemiology: Specializing in epidemiology with an emphasis on research methodology.

--12 credits of epidemiology core courses, including one course each in the fundamentals of epidemiology, intermediate epidemiology methods, epidemiology and control of infectious diseases, and epidemiology and control of chronic diseases

--9 credits of appropriate biostatistics courses

--6 credits of epidemiology electives

--5 credits of public health policy electives

--4 credits of thesis research.

Health policy: Broad background in epidemiology, emphasizing health policy, outcomes, and evaluation research.
--12 credits of epidemiology core courses

--12 credits of health policy courses including health outcomes, health policy, and health services research

--6 credits of biostatistics courses

--2 credits of public health electives or advanced epidemiological/evaluation methods

--4 credits of thesis research.

Biostatistics: Broad background in epidemiology, with expertise in biostatistics.
--12 credits of epidemiology core courses

--12 credits of biostatistical courses, encompassing introduction to biostatistics, statistical methods, and other courses in biostatistics offered through the Department of Statistics in the College of Liberal Arts and Sciences

--8 credits of electives courses in epidemiology and biostatistics

--4 credits of thesis research.

One program strength is its flexibility. The epidemiologist may choose general epidemiology or epidemiology with a concentration in either biostatistics or health policy. This exposure to health policy and biostatistical concepts and applications enables the epidemiologist to bridge the gap between the health field and the analytical process, providing functional interactions with other health professionals in solving complex health issues.

Doctor of Philosophy

The epidemiology doctoral program requires a minimum of 90 semester credits beyond the bachelor's degree. The requirements include a minimum of 12 credits in epidemiology foundation course work, which in most cases will be satisfied by a student's master's degree. It is anticipated that most students may have a directly related master's degrees (i.e. Master of Science in epidemiology or Master of Public Health with a concentration in epidemiology or

biostatistics). Regardless of master's degree, all students will need to demonstrate that they have successfully completed 11 credits of foundation courses in order to take more advanced epidemiology course work. All students must complete a minimum of 37-38 hours of epidemiology core courses, 15 credits of a concentration, 14-15 credits of general electives (which can be satisfied by master's degree course work if approved by the supervisory committee), and at least 12 credits of dissertation work. Students must also complete a teaching experience, which can be fulfilled via a teaching assistantship or other college-level classroom teaching.

The Ph.D. program in epidemiology is mentor driven. All applicants will be reviewed with the expectation that they will work with a primary mentor and receive graduate assistant funding to work on research projects and/or teach during their course of studies.

One program strength is its flexibility. The epidemiologist may choose general epidemiology or epidemiology with a concentration in either biostatistics or health policy. This exposure to health policy and biostatistical concepts and applications enables the epidemiologist to bridge the gap between the health field and the analytical process, providing functional interactions with other health professionals in solving complex health issues.

The courses offered for the M.S. and Ph.D. programs in epidemiology through the College of Medicine as well as those offered for the Ph.D. through the College of Public Health and Health Professions are listed below. An academic adviser will work with the student to plan a course of study that meets the program requirements and the student's interests.

GMS 6800: Fundamentals of Epidemiology(3) *Prereq: graduate standing* Introduction to epidemiology principles and methods for students majoring in any aspect of health.
GMS 6801: Epidemiology, Prevention, and Control of Infectious Diseases (3) *Prereq: GMS 6800 or consent of instructor.* Detailed review of epidemiology, prevention, and control of major infectious diseases and methodology used.
GMS 6802: Epidemiology, Prevention, and Control of Chronic Diseases (3) *Prereq: GMS 6800 or consent of instructor.* Detailed review of epidemiology, prevention, and control of major chronic diseases, risk factors, and methodology.
GMS 6803: Data Management for Epidemiological and Clinical Research (3) *Prereq: consent of instructor.* Data management techniques used for epidemiological and clinical research.
GMS 6804: Medical Informatics (2) *Prereq: GMS 6800, basic statistics, consent of instructor.* Issues in using computerized epidemiological and medical data sources and systems.
GMS 6810: Intermediate Epidemiology Methods (3) *Prereq: GMS 6800 or consent of instructor.* Methodological issues important for designing epidemiological studies of all diseases covered at the

intermediate level.

GMS 6811: Grant Writing Skills in Epidemiology and Clinical Research (2) *Prereq: GMS 6800, 6810, consent of instructor.* Problems and processes in designing and executing epidemiological studies and clinical trials used in grantsmanship.

GMS 6812: Cancer Epidemiology, Prevention, Early Detection, and Control (3) *Prereq: GMS 6800 or consent of instructor.* Detailed review of epidemiology, early detection, prevention, and control strategies of major cancer sites.

GMS 6813: Clinical Trials (2) *Prereq: GMS 6800 or consent of instructor.* Principles for design and conduct. Emphasizes protocol preparations, randomization, sample size, trial monitoring, ethical issues, and data analyses.

GMS 6814: Molecular and Genetic Epidemiology (2) *Prereq: GMS 6800 or consent of instructor.* Human genetics and molecular biology in studying host susceptibility to disease. Mendelian and non-Mendelian genetics.

GMS 6815: Cardiovascular Disease Epidemiology (2) *Prereq: GMS 6800, consent of instructor.* Survey of major cardiovascular diseases including a review of design and methods for studying natural history, prevention, and treatment process.

GMS 6816: Pediatric Epidemiology (2) *Prereq: GMS 6800, consent of instructor.* Overview of selected causes of morbidity and mortality in infants and children. Risk factors and methods used to study disease in this age group.

GMS 6817: Epidemic Investigation (2) *Prereq: GMS 6800, 6801, consent of instructor.* Principles of infectious disease investigation and features of all types of outbreaks. Problem-solving exercises of classic and current epidemics.

GMS 6818: Design and Conduct Clinical Trials I (2) *Prereq: consent of instructor.* Scientific evaluation of health care interventions by clinical trials and the ethics, principles, and conduct of clinical trials in an epidemiological context.

GMS 6819: Design and Conduct Clinical Trials II (2) *Prereq: consent of instructor.* Complex issues in analyzing and interpreting clinical trials.

GMS 6820: Advanced Epidemiology Methods (3) *Prereq: GMS 6800, 6810, consent of instructor.* In-depth examination of the design of epidemiological studies including biases, confounding, misclassification, and the concept of causal models.

GMS 6821: Meta-Analysis in Clinical, Health Services Research and Public Health (2) *Prereq: consent of instructor.* Systematic overviews and meta-analysis techniques. Lectures and laboratory work. Develop and conduct a meta-analysis in small groups.

GMS 6822: Measuring and Analyzing Health Outcomes II (2) *Prereq: consent of instructor.* Cross-cultural translation, data-analysis issues, outcome measures for special populations.

GMS 6826: Advanced Design and Methodology for Case-Control Studies (2) Design, critical assessment, and implementation of case-control studies.

GMS 6827: Advanced Clinical Trial Methods (3; max: 9) *Prereq:*

consent of instructor. Statistical principles and methods used in the design and analysis of clinical trials. Rotating topics include group sequential designs, adaptive clinical trials, and Statistical Monitoring of Clinical Trials.

GMS 6829: Longitudinal Research Design (2) *Prereq: a graduate course in epidemiology, a graduate course in statistics, and consent of instructor.* Design, evaluation, and implementation of cross-sectional and longitudinal research.

GMS 6830: Epidemiology and Health Policy (3) *Prereq: GMS 6800 or consent of instructor.* Reviews general principles and methods of epidemiology and health policy. Using data to establish health policy and legislation. Examples from literature.

GMS 6832: Cost Effectiveness and Cost-Benefit Analysis in Health (3) *Prereq: consent of instructor.* Economic approaches for health care issues including basic cost-benefit and other analyses of limitations.

GMS 6833: Health Care Policy and Vulnerable Populations (3) *Prereq: consent of instructor.* Policy tools used to explore how the health care system can serve vulnerable populations such as the poor, elderly, and children.

GMS 6834: Health Policy and Formulation of Payment Mechanisms for Health Care (3) *Prereq: consent of instructor.* Analytic approaches to developing payment mechanisms. Emphasizes understanding provider reimbursement in health care.

GMS 6835: Health Policy Issues in Children's Health (3) *Prereq: consent of instructor.* Analyzes critical issues in child health policy such as early intervention programs, new morbidities, health care, and insurance status for children in the U.S.

GMS 6841: Design and Analysis of Translational Research in Biomedical Sciences (2) Common statistical analysis methods and widely used experimental design techniques including hypothesis testing, study design, confidence intervals, multiple regression, longitudinal data analysis, Non-linear regression for pharmacokinetics and pharmacodynamics, Kaplan-Meier estimates, proportional hazards models, randomization, and power analysis.

GMS 6842: Translational Research Methods (2) *Prereq: consent of instructor.* Concepts of translational research using a multidisciplinary approach to understand research design ranging from basic science discoveries to implementation of those discoveries in clinical and community settings.

GMS 6844: Experimental and Quasi-Experimental Research Designs for Community Settings (2) *Prereq: consent of instructor.* Research design, sampling, measurement, implementation, analysis, and interpretation for community settings.

GMS 6861: Applied Biostatistics I(3) *Prereq: Consent of Department.* Basic probability and distribution concepts and statistical analysis methods, including descriptive measures, point estimation, hypothesis testing (e.g., t test, analysis of variance, chi-square test etc.), confidence interval, simple linear regression and some nonparametric methods. SPSS will be used for basic statistical analyses.

GMS 6862: Applied Biostatistics II(3) *Prereq: Applied Biostatistics I* Provides background to apply and appropriately interpret statistical applications in the medical and health related fields, and to formulate clinical and basic science research questions in statistical terms.

GMS 6863: Analysis and Study Design for High Dimension, Low Sample Size Data (3) *Prereq: consent of instructor.* Rotating topics include current statistical methods for the study, design and analysis of high dimension, and low sample size data. Emphasizes the importance of scientific thinking and analysis validity. S/U.

GMS 6881: Special Studies in Epidemiology and Health Policy Research(2; max: 4) *Prereq: GMS 6800; consent of instructor.* Advanced or specialized topic in epidemiology or health policy with the approval of the instructor. S/U.

GMS 6882: Directed Readings in Epidemiology and Health Policy (2) *Prereq: GMS 6800 or consent of instructor.* Student selects an advanced or specialized topic in epidemiology or health policy with instructor approval.

GMS 6883: Practicum Experience in Epidemiology and Health Policy (2) *Prereq: GMS 6800 or consent of instructor.* Student selects a state or federal health agency or research project in epidemiology and health policy with instructor approval. S/U.

GMS 6884: Research in Epidemiology and Health Policy (2) *Prereq: GMS 6800, consent of instructor.* Individual, approved research topic or project in epidemiology and health policy.

GMS 6892: Seminar I: Epidemiology Past, Present, and Future (3; max: 6) *Prereq: consent of instructor.* Historical development, philosophy, culture, and current state of epidemiological practice and science.

GMS 6893: Clinical and Translational Science Seminar Series (2; max: 6) *Prereq: consent of instructor.* Researchers discuss clinical, laboratory, epidemiologic, and economic aspects of a given topic; also, intervention strategies and community outreach activities. Exposure to faculty who may be available for Clinical Preceptorship assignments. Topics rotate every 2 weeks.

GMS 6894: Epidemiology Journal Club (1) *Prereq: consent of instructor.* Practice reviewing and critiquing research studies.

GMS 6971: Research for Master's Thesis (1-15) S/U.

GMS 6xxxG: Data Management for Epidemiologic and Clinical Research (2) *Prereq: consent of instructor.* Data management techniques used for epidemiological and clinical research.

GMS 6xxxL: Measuring and Analyzing Health Outcomes I (2) *Prereq: consent of instructor.* Measurement methods currently used in medical research and clinical settings.

GMS 6xxxP: Methods for Evaluating Health Care Outcomes and Costs: Module 3 (1; max: 6) *Prereq: background in basic statistics, familiarity with concepts covered by this course, and consent of instructor.* Fundamental econometric methods for evaluating health care outcomes and cost.

GMS 6xxxQ: Methods for Evaluating Health Care Outcomes and Costs: Module 2 (1; max: 6) *Prereq: consent of instructor.*

Cost-effectiveness, cost-utility, and cost-benefit analyses in health care.

GMS 6xxxR: Methods for Evaluating Health Care Outcomes and Costs: Module 1 (1; max: 6) *Prereq: consent of instructor.* Introduction to the use of decision sciences in health care.

PHC 6001: Principles of Epidemiology in Public Health(3) Epidemiology methods frequently used to study disease patterns in community and clinic-based populations. Includes distribution and determinants of health-related states or events in specific populations and application to control of health problems.

PHC 6003: Epidemiology of Chronic Diseases and Disability (3) *Prereq: PHC 6001, and PHC 6052 or PHC 6050 or departmental approval.* Overview of epidemiology of chronic diseases and disabilities prevalent in various populations. Introduces contemporary methods for surveillance including risk factors, etiology, and changes over time.

PHC 6011: Epidemiology Methods II (3) *Prereq: PHC 6000 and PHC 6052, or departmental approval.* Analytic methods in epidemiology with a foundation in applied epidemiological analysis and experience in peer-review productivity based on secondary data analysis.

PHC 6014: Epidemiology, Prevention, and Control of Chronic Diseases II (3) *Prereq: PHC 6001 and 6003 or equivalent.* Survey of major chronic diseases not covered in PHC 6003. Emphasizes recent epidemiology research and findings.

PHC 6711: Measurement in Epidemiology and Outcomes Research (3) *Prereq: PHC 6001 and PHC 6050 or equivalent.* Major designs and principles of measurement for epidemiology and health services outcomes research, with emphasis on use of primary data collection.

PHC 6716: Survey Research Methods (3) *Prereq: PHC 6001, 6050; and STA 6207 or equivalent, or permission of instructor.* Introduction to population surveys typical in descriptive (surveillance) and analytic epidemiology research.

PHC 6717: Theory and Methods in Public Health Disability Research (2-3; max: 3) *Prereq: PHC 6001 and PHC 6050 or equivalent.* Interplay of epidemiology, disability, and public health in America. Theoretical framework and applied research methods for disability research.

PHC 7980: Research for Doctoral Dissertation (1; max: 15) S/U.

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Family, Youth, and Community Sciences

College of Agricultural and Life Sciences

Graduate Faculty

Chair: N. I. Torres. *Graduate Coordinator:* M. E. Swisher.
Complete faculty listing by department: Follow this link

The Department of Family, Youth, and Community Sciences offers two graduate social science degrees. The Master of Science in Family, Youth, and Community Sciences is a research degree that prepares students to conduct original research about problems, issues, and policies affecting families, youth, and communities. The Master of Family, Youth, and Community Sciences prepares students for mid-level leadership positions in public and private organizations, agencies, and businesses that address the needs of families, youths, and communities. Descriptions of the requirements for the M.S. and M.F.Y.C. degrees are provided in the *General Information* section of this catalog.

A minor in Family, Youth, and Community Sciences provides students from other areas with knowledge about the theories and body of research that explain how families, youths, and communities develop and interact. The programs emphasize an ecological model in which the interactions and relationships among the individual, the family, and the community form the framework for addressing the issues, problems, and policies that affect youths, families, and communities in the United States and globally.

The minor in Not-for-Profit Organizations provides students from other disciplines with an understanding of how to develop organizations to address problems facing families, youth, and

communities. The minor consists of six hours of study. Prospective graduate students need not have majored in family, youth, and community sciences as an undergraduate. Students with an insufficient background in relevant social sciences will need to include basic courses in their programs of study. Students are encouraged to complete course work outside the department in relevant areas, selecting appropriate courses in close consultation with their supervisory committees.

The department offers a combined bachelor's/master's program and a joint degree program with the Levin College of Law. The Department of Family, Youth and Community Sciences offers three concentrations which appear on the student's transcript alerting employers to the student's expertise and skills and helping employers identify those graduates who are particularly well positioned to work in these areas.
A **community studies** concentration provides students with the specific knowledge and skills they need to provide professional guidance for community-based organizations in order to effectively mobilize the community, resolve intra-community conflicts, develop responsive organizations within the community, and identify, marshal and use the resources that are available to communities.

A concentration is also available in **family and youth development** which prepares students to work with youth and families through community-based programs. The concentration combines the study of theories of family and youth development with courses that help students develop the skills needed to offer programs and give leadership to public and private sector organizations serving youth and families.

The **nonprofit organizations development** concentration prepares students to work with tax-exempt and informal community-based organizations that serve a charitable purpose for the public good. The concentration courses provide an in-depth understanding for developing and sustaining an efficient and effective nonprofit organization which includes competencies in governance, strategic planning, fund raising, risk management, financial planning, and other tools.

Contact the graduate coordinator for information.

FYC 5425: Risk Management in Nonprofit Organizations (3) *Prereq: FYC 6421 Nonprofit Organizations.* Theory, principles, and techniques associated with risk management. Nature and purpose of risk management. General risk management exposures facing nonprofit organizations. Risk financing strategies for nonprofits.
FYC 6020: Principles of Family, Youth, and Community Sciences (3) *Prereq: principles of sociology; general psychology.* Critical issues in the new century. Applying key principles of family,

youth, and community sciences to selected problems.

FYC 6111: Families and Violence (3) Examines the major types of family violence across the life span, including all forms of child maltreatment, intimate partner violence, and elder abuse.

FYC 6131: Ethics for FYCS Practitioners (3) Basic elements of ethics, professional ethics, and professionals as ethical "agents."

FYC 6207: Adolescent Problematic Behavior(3) *Prereq: core major courses.* Ecological model to examine common themes of adolescent development with challenges that lead to problematic behavior.

FYC 6221: Grant Proposals for Community-Based Organizations (3) Skills needed to develop funding proposals to support community-based projects and organizations.

FYC 6222: Parenting and Child Relationships(3) *Prereq: core courses.* Relationships affecting child development outcomes.

FYC 6223: Promoting Positive Youth Development (3) *Prereq: FYC 6207.* Examines risk and protective factors for promoting youth development.

FYC 6224: Resilience and Positive Youth Development (3) *Prereq: FYC 6230 Theories of Youth and Family Development.* Conceptual and applied examination of resilience as a shaping force in youth development from infancy through the emerging adult years.

FYC 6230: Theories of Youth and Family Development (3) *Prereq: SYG 2430 or FYC 3101 and 3201.* Historical and contemporary theories of youth and family development.

FYC 6234: Theoretical Approaches to Youth Programming (3) In-depth examination and synthesis of historical (macro) and contemporary (micro) theories of youth development as they are used to inform the development of youth programs and services, curricula for nonformal community settings, and program planning and evaluation.

FYC 6302: Sustainable Community Development (3) Relationships among economic, social, and environmental aspects of sustainability. Analytic and professional skills to build sustainable communities. Community study and in-depth analysis.

FYC 6320: Community Development (3) Process and methods for community development. Develops skills for managing change in communities.

FYC 6330: Theories of Community Development (3) Sociological concept of community and its application in public development policies.

FYC 6331: Involving Youths in Community Issues (3) Overview of methods for investigating community issues. How to engage youths in scientific, technological, and social issues at the community level.

FYC 6421: Nonprofit Organizations (3) Community nonprofit organizations. Governance, policy and decision making, and planning.

FYC 6422: Policy Issues and Case Studies in Nonprofit Organizations(3) *Prereq: FYC 6241.* Study and analysis of policy

and cases related to development and operation of nonprofit organizations.

FYC 6423: Non-Governmental Organizations (3) *Prereq: FYC 6421.* Non-governmental organizations and their political and economic impacts.

FYC 6424: Fund Raising for Community Nonprofit Organizations (3) *Prereq: FYC 6421.* Critical evaluation of fund raising theory, research on the profession, and best contemporary fund raising practices in the nonprofit sector.

FYC 6620: Program Planning and Evaluation for Human Service Delivery (3) *Prereq: core FYCS courses.* Contemporary theories and process for planning and evaluating human service education and delivery programs.

FYC 6660: Public Policy and Human Resource Development (3) Current policies and laws impacting youths, families, and communities. Strategies to change these policies and laws.

FYC 6801: Scientific Reasoning and Research Design(3) Scientific reasoning, scientific method, and quantitative and qualitative research design.

FYC 6802: Advanced Research Methods for Family, Youth, and Community Sciences (3) *Prereq: FYC 6801 or equivalent.* Research tools and techniques appropriate for an ecological model, emphasizing a multi-method approach.

FYC 6901: Problems in Family, Youth, and Community Sciences(1-3; max: 6) Advanced students select and study problem related to family, youth, and community sciences.

FYC 6912: Nonthesis Project in Family, Youth, and Community Sciences (1-3; max: 6) Developing an original applied project such as program evaluation, policy analysis, or in-depth review of current issue in human resource development.

FYC 6932: Topics, in Family, Youth, and Community Sciences(1-3; max: 6) Critical review of selected topics.

FYC 6933: Seminar in Human Resource Development (1; max: 2) Explores current topics, trends, and research findings. S/U.

FYC 6934: Professional Internship/Practicum in Family, Youth, and Community Sciences(1-3; max: 6) Directed work experience or internship in professional capacity.

FYC 6971: Research for Master's Thesis (1-6) S/U.

Community Studies

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Finance, Insurance, and Real Estate

Warrington College of Business Administration

Graduate Faculty

Chair: M. Nimalendran. *Graduate Coordinator:* M. D. Ryngaert.
Complete faculty listing by department: Follow this link

The Department of Finance, Insurance, and Real Estate offers graduate work leading to the Master of Science degree with major programs in finance, in real estate, and in entrepreneurship (nonthesis option); and the Doctor of Philosophy degree in business administration with a concentration in finance or real estate. Complete descriptions of the minimum requirements for the M.S. and Ph.D. degrees are provided in the *General Information* section of this catalog.

Finance, real estate, and entrepreneurship are also available as concentrations within the M.B.A program. For information about the M.B.A. program, please consult that listing in the *General Information* section.

Doctor of Philosophy - The Ph.D. program has a strong emphasis on scholarly research training. Admission requirements include (a) minimum grade point average of 3.5 in the last two years of an undergraduate program and in any previous graduate-level work, (b) minimum GRE score of 1300 or GMAT score of 600 (both verbal and quantitative scores must exceed the sixtieth percentile), and (c) (for nonnative speakers of English) a minimum score of 550 on the TOEFL. Generally students will not be admitted to the Ph.D. program unless they have been offered financial assistance by the University. Detailed information about the finance and real estate

concentrations is provided below.

Finance

The student pursuing a concentration or major in finance typically specializes in corporate finance, financial markets and institutions, or investments. The Ph.D. curriculum consists of course work of four types: research foundations, the major field, a minor or supporting field, and a breadth requirement.

The research foundation requirements are comprised of courses in microeconomic theory, macroeconomic theory, mathematical methods and applications to economics, mathematical statistics, and econometrics. The actual courses will depend on the student's background and proposed thesis research.

The major field in finance consists of at least 16 credit hours in graduate course work in finance including financial theory, corporate finance, and seminars in empirical methods, market micro structure, and special topics. Students may elect to have one "strong" minor (16 credit hours), two "weak" minors (8 credit hours each), or a supporting field which is not declared as a minor. If a supporting field is chosen, at least 16 hours of course work acceptable to the student's supervisory committee must be taken. The supporting field option is selected when a student wishes to take courses across a number of departments. The department offers a combined B.S./M.S. program. Contact the graduate coordinator for information.

The breadth requirement applies only to students with no prior course work in business and consists of financial and managerial accounting or their equivalents, plus two courses out of the following areas: managerial economics, production operations management, or problems and methods in marketing management. Other requirements are listed in the *General Information* section of this catalog.

Master of Science degree in finance, nonthesis option: This M.S. program option consists of at least 32 credits in letter-graded courses. It is designed to ensure that each student acquires a basic knowledge of the major financial economics subject areas: corporate finance, derivatives, fixed income securities, investments, international finance, and real estate. The program is designed to prepare students with an undergraduate background in finance for positions in commercial banking, money management, investment banking, and securities markets. The Department also offers a combined bachelor's/master's program. Contact the graduate coordinator for information.

Master of Science degree in finance/juris doctorate joint degree program: This joint degree program culminates in the M.S.

and J.D. degrees. Applicants must meet the entrance requirements for both the Warrington College of Business Administration and the Levin College of Law. Admission to the second degree program is required no later than the end of the second consecutive semester after beginning one degree in the joint program.

Real Estate

The research foundations are identical to those listed above for finance. The major field, minor, and supporting field requirements have the same credit stipulation as those outlined above for finance, except that the major work is in real estate.

The breadth requirement, as in all concentrations for the business administration program, applies only to students entering without prior course work in business. It consists of at least three courses from the following list (two or more fields must be represented): managers and legal environment of business, finance, money and capital markets, problems and methods of marketing management, consumer behavior, and financial and managerial accounting.

Master of Science degree in real estate, nonthesis option: This M.S. option consists of at least 34 credits of letter-graded courses. It is designed to ensure that each student acquires a basic knowledge of the various functional areas in real estate, real estate finance and investment, real estate development, real estate law and institutions, real estate asset management, international real estate, and advanced training in specialized areas. The capstone course (REE 6948) involves actual projects in which students work in teams to undertake a real estate problem for real clients. This two-tiered program of study provides both a firm theoretical foundation for later professional effectiveness and an applied bridge to professional practice.

Master of Science degree in real estate/juris doctorate joint program: This joint degree program culminates in the M.S. and J.D. degrees. Applicants must meet the entrance requirements for both the Warrington College of Business Administration and the Levin College of Law. Admission to the second degree program is required no later than the end of the second consecutive semester after beginning one degree of the joint program.

Entrepreneurship

Master of Science degree in entrepreneurship, nonthesis option: This M.S. program consists of at least 30 credits in letter-graded courses. It is designed to provide students with the entrepreneurial and innovation skills needed for the cultivation and development of entrepreneurial practice and innovation management. Development of skills in idea generation, feasibility analysis, business plan creation, and management of early-stage

and high-growth ventures are an integral part of the program. Students are not required to have an undergraduate degree in business.

ENT 6008: Entrepreneurial Opportunity (2) Introduces non-business graduate students to entrepreneurship and the entrepreneurial process.
ENT 6106: Venture Analysis (2) Explores and critiques real-world examples of how new business ventures were conceived, started, and run.
ENT 6115: Entrepreneurship (2) Practical, hands-on understanding of the stages of the entrepreneurial process. Focuses on the decision-making process in a start-up company.
ENT 6116: Business Plan Formation (2) *Prereq: GEB 6115. Designed for M.B.A. students.* Professional development and preparation of a company business plan. Full analysis of the plan and outside evaluation and ranking.
ENT 6416: Venture Finance (2) Capital structure and financing needs of start-up companies. Valuation of nonpublicly traded companies. Intellectual property.
ENT 6506: Social Entrepreneurship (2) Process of starting, financing, assessing and managing succession of mission-based for-profit and not-for-profit ventures.
ENT 6616: Creativity in Entrepreneurship (2) Explores the fundamental tools used to make both individuals and organizations more creative and innovative.
ENT 6905: Individual Work in Entrepreneurship (1-4; max: 8) Individual work in an Entrepreneurship related topic.
ENT 6930: Special Topics (1-4; max: 8) Rotating topics in special topics in entrepreneurship-related fields of study.
ENT 6946: Entrepreneurial Consulting Project (2) To teach entrepreneurship by working the through real problems of real companies. To teach team dynamics, goal setting, and project management in an unscripted environment. To aid the economy by producing value-adding solutions to business problems.
ENT 6957: International Studies in Entrepreneurship (1-4; max: 8) Academic credit for courses taken overseas.
FIN 5405: Business Financial Management (3) *Prereq: ACG 5065. Required of all MBA degree candidates who have had no basic business finance course.* Analysis of business financing and investing decisions.
FIN 5437: Finance I: Asset Valuation, Risk, and Return (2) *Prereq: must be M.B.A. student. Required of all M.B.A. students who lack basic business finance course.* Analysis of business financing and investing decisions. Selected financial tools and concepts. Risk analysis and capital budgeting.
FIN 5439: Finance II: Capital Structure and Risk Management Issues (2) *Prereq: FIN 5437. Required of all M.B.A. students.* Continuation of FIN 5437. Focus on corporate financial decision

making.

FIN 6108: Personal Financial Management (1; max: 2) *Prereq: designed for students admitted in MBA program.* Personal financial planning, how to accumulate and preserve personal wealth, creating an integrated financial plan, financial modeling, tax planning, portfolio construction and the fundamentals of risk and insurance.

FIN 6246: Money and Capital Markets (3) *Prereq: FIN 5405, college-level mathematics, and statistics.* Financial markets, with emphasis on flow of funds, interest rate determination, and allocation of resources.

FIN 6306: Investment Banking (2) *Prereq: FIN 5439. Designed for M.B.A. students.* Hands-on approach to various aspects of investment banking industry. Lectures and guest speakers from investment banking firms.

FIN 6418: International Cash Flow Management(2) Working capital management and cash management with emphasis on international applications.

FIN 6425: Corporation Finance (3) *Prereq: FIN 5405 or consent of instructor. Designed for MBA students.* Applying business finance problems. Students prepare written solutions to case problems.

FIN 6427: Measuring and Managing Value (2) *Prereq: FIN 5439 or Master of Science-Finance students.* Applying basic financial theory to valuing companies and creating value through sound financial decision making.

FIN 6429: Financial Decision Making (2) *Prereq: FIN 5439 or Master of Science-Finance students.* Applying basic financial theory to help managers determine how to finance their businesses. Optimal debt policy, distribution of firm cash flow policies, equity issuance strategies, risk management, and using hybrid securities in financing business.

FIN 6434: Private Equity(2) *Prereq: FIN 5439 or Master of Science-Finance students.* Overview of the private equity market and the role of intermediaries. How intermediaries add value in the private equity market.

FIN 6438: Study in Valuation (2) *Prereq: FIN 5439 or Master of Science-Finance students.* Independent analysis of firms in industry. Assessment of relative investment attractiveness of these firms and industry. Projects presented and critiqued by investment professionals.

FIN 6465: Financial Statement Analysis (2) *Prereq: FIN 5439 or Master of Science-Finance students.* Examination of fundamental analysis of corporate financial statements. Identification of reliable estimates of fundamental corporate earning power and earning risks.

FIN 6518: Investment Concepts (2) *Prereq: FIN 5439 or Master of Science-Finance students.* Survey of current theory and practice. Asset pricing theory and empirical test, bond and equity valuation, efficient markets, international management, and valuation and use of derivative securities.

FIN 6525: Asset Management Project(1; max: 2) Training in optimal portfolio allocation, measuring tracking error/value at risk

and performance attribution. Group experience to manage and evaluate portfolios.

FIN 6526: Portfolio Theory (2) *Prereq: FIN 5439 or Master of Science-Finance students.* Survey of modern approaches in security portfolio management. Two levels of examination: (1) management of owner's aggregate portfolio and (2) security selection strategies, such as mutual funds, followed by managers.

FIN 6537: Derivative Securities (2) *Prereq: FIN 5439 or Master of Science-Finance students.* Principles of derivatives. Structure and operation of markets, theoretical foundations and valuation models for various securities, and practical applications in investments and risk management, and financial engineering.

FIN 6545: Fixed Income Security Valuation (2) *Prereq: FIN 5439. Designed for M.B.A. students.* Basics of interest rate determination, forward rates, and effects of interest rate uncertainty on holding period returns. Also pricing of fixed income securities with attached options.

FIN 6547: Interest Rate Risk Management (2) *Prereq: FIN 6545.* Basic tools. Concepts of duration, immunization, and hedging with financial futures.

FIN 6549: Special Topics in Fixed Income Securities(2) *Prereq: FIN 6545.* Municipal bond markets and timing strategies; performance attribution and tracking error; and asset allocation for pensions and endowments.

FIN 6595: Investment Analytics (2) *Prereq: Master of Science-Finance students or MBA with concentration in Finance.* Examines the theory and the quantitative empirical tools that are necessary for global asset allocation in an institutional setting.

FIN 6608: Financial Management of the Multinational Corporation (2) *Prereq: FIN 5439 or M.S.-finance student or M.A.-international business students.* Issues unique to global operating environment or significantly different from their purely domestic counterparts. Use of different national as well as global capital markets to manage the finance function.

FIN 6626: International Finance(3) Financial markets and institutions, and problems by corporations operating in the international environment.

FIN 6638: International Finance (2) *Prereq: FIN 5439 or Master of Science-Finance or Master of Arts-International Business students.* Introduction to markets. Focus on foreign exchange markets, international bond markets, and international equity markets.

FIN 6643: Project Analysis in a Global Environment(2) Evaluation of long-term investment decisions. Analysis of foreign direct investment.

FIN 6727: Economic Organizations and Markets (2) *Prereq: FIN 5439. Designed for M.B.A. students.* Economics based approach to organizational issues including compensation, assignment of decision rights, and assessment of performance.

FIN 6729: Economics Organizations and Markets (3) Economics-based approach to organizational issues including

compensation, assignment of decision rights, and assessment of performance. Examination of corporate governance issues, i.e., conflicts between stockholders and managers.

FIN 6905: Individual Work in Finance (1-4; max: 7) *Prereq: permission of department and Director of Graduate Studies.* Reading and/or research in finance as needed by graduate students.

FIN 6930: Special Topics in Finance (1-4; max: 16) Selected topics in financial research, theory, or of special current significance.

FIN 6935: Finance Professional Speaker Series(1; max: 2) Rotating presentations by prominent finance professionals, providing informed perspective on career strategies, opportunities, and real-life applications.

FIN 6940: Supervised Teaching (1-5; max: 5) S/U.

FIN 6957: International Studies in Finance (1-4; max: 12) *Prereq: admission to approved study abroad program and permission of department.* S/U.

FIN 6958: International Finance Study Tour (2) Academic and practical exposure to international financial markets and international business practices.

FIN 6971: Research for Master's Thesis (1-15) S/U.

FIN 7446: Financial Theory I (4) The first in a two-course sequence. Emphasis on the theory of the firm's investment and financing decisions.

FIN 7447: Financial Theory II (4) Emphasis on the theory of the financial intermediary system asset pricing theory.

FIN 7808: Corporate Finance (4) Theory and empirical analyses of corporate financial decisions in a world of risk with both perfect and imperfect markets.

FIN 7809: Investments (4) Theory and empirical analyses of security investment decisions in a world of risk with both perfect and imperfect markets.

FIN 7848: Marketing Microstructure(2) Empirical research in finance, focused on the application of econometric and statistical techniques to address research problems in finance.

FIN 7938: Finance Research Workshop (1-4; max: 7) Analysis of current research topics. Paper presentation and critiques by doctoral students, faculty, and visiting scholars.

FIN 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

FIN 7980: Research for Doctoral Dissertation (1-15) S/U.

GEB 5114: Entrepreneurship and Venture Finance (3) Entrepreneurial processes. Exploration of boom in world economies. Participation in entrepreneurial culture.

GEB 5118: New Venture Creation (4) Classroom lectures, panels of leading entrepreneurs, and team project. Background and tools necessary to develop an investment-grade business plan for a new venture, whether intracorporate or stand-alone.

GEB 5146: Family Business Management (2) Crucial aspects of

managing small business enterprises. Identifying and analyzing characteristic operating problems of small firms and techniques for solving them. Strategic operating and psychological issues associated with running a privately-held or family firm.

GEB 5506: Corporate Intrapreneurship (2) Examines, defines, and characterizes the role of the intrapreneur in a corporation. Transition from entrepreneurship to intrapreneurship. Skills and methodology for successful intrapreneurship.

GEB 6119: Technology Venture Sequence(2) Background and tools needed to participate in new venture creation process. Development of business plans.

GEB 6157: Entrepreneurship Experiential Learning Project (1-3; max: 3) *Coreq: Must be a graduate student to receive graduate credit* Development of entrepreneurial skills in business through authentic experiences.

GEB 6366: Fundamentals of International Business (2) *Prereq: designed for M.B.A. students.* Complexities of extending the market to more than a single nation/state. Impact on multinational corporation of different cultures and languages, multiple legal systems, national and global capital markets, foreign exchange, and political issues.

GEB 6507: Entrepreneurial Finance (2) Investigate conventional principles of corporate finance that can be used to analyze the financing needs of new ventures.

GEB 6935: Entrepreneurship Professional Speaker Series (1-2; max: 2) *Prereq: Must be an MS-Entrepreneurship student* Topics relevant to entrepreneurship and innovation.

MAN 6747: Managing Innovation and Change (2) Explores the interaction of innovation and change. Organizational approaches and systems applications.

REE 6045: Introduction to Real Estate(2) *Prereq: graduate standing.* Real estate finance, appraisal, and law.

REE 6105: Real Estate Appraisal (2) *Prereq: REE 6045 or REE 6395.* Tools and techniques used in the fee appraisal business to estimate market value of real property. Emphasis on commercial appraisal using actual case studies.

REE 6206: Primary Mortgage Markets and Institutions (2) *Prereq: Master of Science-Finance students or FIN 5437 and FIN 5439 (REE 6045 is highly recommended).* Introduces firms, institutions, practices, and legal issues involved in housing finance. Also potential variation in home mortgage product design and issues that dictate mortgage choice.

REE 6208: Secondary Mortgage Markets and Securitization (2) *Prereq: REE 6045 or REE 6206 or Master of Science-Finance students or FIN 5437 and FIN 5439.* High-level overview of secondary markets for mortgage debt and mortgage-backed securities in U.S. Considers instruments, decisions, problems, and current issues.

REE 6315: Real Estate Market and Transaction Analysis(2) *Prereq: Master of Science-Real Estate or MBA students.* Application of analytical process for analyzing market potential of both

developed and undeveloped real estate. Broadened historic perspective on modern city and understanding of how to apply analytical framework to real estate market analysis. Process and documents associated with acquiring and disposing of commercial real estate areas discussed.

REE 6395: Investment Property Analysis (2) *Prereq: REE 6045 or Master of Science-Finance students or FIN 5437 and FIN 5439 (REE 6045 is highly recommended).* Introduction to major concepts, principles, analytical methods, and tools useful for investment and finance decisions regarding commercial real estate assets. Property acquisition analysis, leasing, effects of debt financing and taxes, risk and return considerations.

REE 6397: Real Estate Securities and Portfolios (2) *Prereq: REE 6045 or REE 6395 or Master of Science-Finance students or FIN 5437 and FIN 5439.* Securitized equity real estate investment topics, including real estate investment trusts. Emphasis on multiple property valuation and decision making.

REE 6705: Geographic Information Systems and Location Analysis (2) *Prereq: Graduate standing.* Examines many traditional ways of analyzing and evaluating location. Introduces relevant data sources, GIS software and numerical and statistical techniques for computer-based study of spatial relationships.

REE 6905: Individual Work in Real Estate (1-6; max: 7) *Prereq: permission of department and Director of Graduate Studies.* Reading and/or research in real estate.

REE 6910: Supervised Research (1-5; max: 5) S/U.

REE 6930: Special Topics in Real Estate (1-4; max: 16) Selected topics in real estate research, theory, or of special current significance.

REE 6935: Real Estate Case Studies (1-2; max: 5) *Prereq: Master of Science-Real Estate or joint MSRE/JD students.* Project- and case-oriented approach, using "real world" projects and data. Introduction to data sources and computer programs widely used in the industry.

REE 6940: Supervised Teaching (1-5; max: 5) S/U.

REE 6948: Capstone Seminar and Applied Project (2) *Prereq: REE 6208.* Establishes direct link between concepts developed in prior courses and current industrial practices. Presentations by professionals on current issues and industry practices. Students develop an applied project case.

REE 6957: International Studies in Real Estate (1-4; max: 12) *Prereq: admission to approved study abroad program and permission of department.* S/U.

REE 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

REE 7980: Research for Doctoral Dissertation (1-15) S/U.

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Fisheries and Aquatic Sciences

College of Agricultural and Life Sciences

Graduate Faculty

Chair: T. K. Frazer. *Graduate Coordinator:* C. Cichra. *Complete faculty listing by department*: Follow this link

The Department of Fisheries and Aquatic Sciences conducts research, teaching, and extension programs in four broad areas:

--Sustainable fisheries
--Aquaculture
--Aquatic animal health
--Conservation and management of aquatic environments

The department offers graduate study leading to the Master of Science, Master of Fisheries and Aquatic Sciences (nonthesis), and Doctor of Philosophy degrees with a program in fisheries and aquatic sciences. Requirements for these degrees are given in the *General Information* section of this catalog.

Research programs of faculty encompass water quality and chemistry, fish ecology, marine and estuarine ecology, paleolimnology, crustacean biology, fish and shellfish genetics, fish and shellfish reproduction and endocrinology, fish health management, fish population dynamics, phycology/microbiology, stream ecology, and aquatic plant science and management. Research associations exist with the Whitney Marine Laboratory, College of Veterinary Medicine, National Biological Survey, National Marine Fisheries Service, Harbor Branch Oceanographic Institute, Mote Marine Laboratory, and several state agencies.

Graduate study in the Department of Fisheries and Aquatic Sciences emphasizes the needs and interests of individual students. Graduate students in the Department work closely with their faculty advisers to develop comprehensive programs of study. Admission to graduate study is based on the individual merits and interests of the applicant, fulfillment of the general admission requirements of the Graduate School, and acceptance by a faculty adviser in the Department.

Prospective applicants should request an application packet from the Program Assistant, Department of Fisheries and Aquatic Sciences, University of Florida, 7922 NW 71st St., Gainesville, FL 32653-3071.

The department offers a combined bachelor's/master's degree program.
Contact the graduate coordinator for information.

FAS 5203C: Biology of Fishes (4) *Prereq: BSC 2011/2011L or consent of instructor.* Emphasizes trends in evolution, integrative and sensory biology, physiology, feeding ecology, reproduction, growth, and population dynamics as they relate to fisheries. Offered fall term in odd-numbered years.
FAS 5255C: Diseases of Warmwater Fish (3) *Prereq: consent of instructor.* Intensive, 2-week course (80 contact hours) in methodology for diagnosing and treating parasitic, bacterial, viral, nutritional, and environmental diseases of warmwater food fish and aquarium species. Offered summer term in even-numbered years.
FAS 5276C: Field Ecology of Aquatic Organisms (4) *Prereq: FAS 4305C or consent of instructor.* Understanding principles of fish and shellfish ecology through field studies. Intensive study in lakes, rivers, and coastal marshes to gain understanding of how fish and shellfish interact with their environment. Requires extensive field trips. Offered summer term.
FAS 5335C: Applied Fisheries Statistics (4) *Prereq: FAS 5276C or consent of instructor.* Population sampling and estimation, statistical assumptions and robustness, mark-recapture, growth, and empirical modeling of populations. Offered fall term in even-numbered years.
FAS 5901: Scientific Thinking in Ecology(2) General philosophical foundations of science and specific critiques and perspectives found in ecology and aquatic sciences. Offered fall term.
FAS 6154: Aquatic Invertebrate Ecological Physiology (3) *Prereq: undergraduate course in animal physiology.* Biochemical, physiological, behavioral, and ecological adaptations that allow animals to survive in particular environments.
FAS 6171: Applied Phycology (3) *Prereq: undergraduate chemistry or biochemistry.* Ecology, management, use, and control of freshwater and marine algae and aquatic microorganisms. Overview of associated products, processes, and problems and

economic implications. Offered fall term in even-numbered years.
FAS 6337C: Fish Population Dynamics (4) *Prereq: STA 6166.* Analyzing fish populations for management purposes. Methods for estimating population parameters such as growth, recruitment, and mortality. Using population parameters and computer models to predict yield and catch composition, and bioenergetics approaches for fisheries management problems. Offered spring term in odd-numbered years.
FAS 6355C: Fisheries Management (4) *Prereq: FAS 5276C or consent of instructor.* Integrating scientific, social, political, and legal factors in fisheries management. Offered fall term in odd-numbered years.
FAS 6905: Individual Study (1-6; max: 10) Contemporary problem or topic. H.
FAS 6910: Supervised Research (1-5; max: 5) S/U.
FAS 6932: Special Topics in Fisheries and Aquatic Sciences (1-4; max: 10) Fisheries biology, aquaculture, and associated aquatic sciences.
FAS 6933: Seminar (1; max: 3) S/U.
FAS 6935: Contemporary Problems in Fisheries and Aquatic Sciences (2; max: 10) *Prereq: graduate student standing.* Library research, oral reports, and discussions of scientific problems or topics announced in advance. Offered fall and spring terms.
FAS 6940: Supervised Teaching (1-5; max: 5) S/U.
FAS 6971: Research for Master's Thesis (1-15) S/U.
FAS 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been admitted to a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
FAS 7980: Research for Doctoral Dissertation (1-15) S/U.

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Food and Resource Economics

College of Agricultural and Life Sciences

Graduate Faculty

Chair: R. G. Huffaker. *Graduate Coordinator:* C.B. Moss and A. F. Wysocki. *Complete faculty listing by department*: Follow this link

The degrees of Master of Agribusiness (non-thesis), Master of Science with concentration in Agribusiness (non-thesis), Master of Science (thesis), and Doctor of Philosophy are offered with a program in Food and Resource Economics. Requirements for these degrees are given in the *General Information* section of this catalog.

Areas of specialization include agribusiness management, marketing, production, economic development, international trade and competition, econometrics, public policy, firm theory and management, and natural resource and environmental economics. The Department participates in programs with the Centers for Latin American Studies, African Studies, Tropical Agriculture, the School of Natural Resources and Environment, the College of Law, the Florida Sea Grant College Program, and the International Trade and Policy Center.

The Department offers a combined bachelor's/master's degree program. Contact the Department Graduate Program Office for information. In addition to the courses listed, there are seminars for organized discussion of current topics and for review of graduate student research.

AEB 5167: Economic Analysis in Small Farm Livelihood

Systems (3) General analysis techniques used to enhance economic analysis of small-scale, limited-resource family farm livelihood systems to evaluate impact of proposed technology, infrastructure, and policy changes on family welfare. Linear programming and regression. Emphasis on tropical agriculture.

AEB 5188: Economics of Agribusiness Decisions (3) *Prereq: AEB 3103 or ECO 2023.* Comprehensive treatment of microeconomic theory and its use in managerial decision making.

AEB 5326: Agribusiness Financial Management (3) *Prereq: ACG 2021C.* Integration of finance and management decision-making tools to solve advanced financial and other management problems faced by agricultural firms and agribusinesses.

AEB 5387: Advanced Agribusiness and Food Marketing Management (3) *Prereq: FIN 3408, AEB 3343 or MAR 3023; AEB 3133 or MAN 3025.* Advanced decision-making skills for marketing situations, deductive reasoning, quantitative analysis, and marketing skills stressed in case studies.

AEB 5516: Quantitative Methods in Agribusiness Decisions (3) *Prereq: STA 2023.* Introduction to variety of quantitative methods with application to business decision-making contexts.

AEB 5757: Strategic Agribusiness Human Resource Management (3) Issues involved in strategic and effective leadership and management in agribusiness sector of economy. Emphasis on human resource ideas and techniques that managers utilize to improve organizational teamwork, productivity, and performance.

AEB 6106: Microeconomic Principles and Analysis (3) *Prereq: ECO 3101 and MAC 2311 or equivalents.* Economics as a behavioral science describing actions of consumers and producers interacting in the market process; welfare economics; property rights; competition and equilibrium. Institutional backdrop for market process. Problem solving using economic principles.

AEB 6108: Microeconomic Theory II(3) *Prereq: ECO 7115.* Continuation of Microeconomic Theory I. Theory of the firm, market theory, market failure (externalities, market power, and asymmetric information). Game theory and applications. General equilibrium theory, welfare trade theory, and agricultural trade policy.

AEB 6139: Strategic Agribusiness Management (3) *Prereq: AEB 5188, AEB 5326, AEB 6225, AEB 5757, AEB 6675.* Core concepts of strategic decision-making and how strategy influences economic and financial value of food and agribusiness firms.

AEB 6145: Agricultural Finance (3) *Prereq: AEB 3144 or FIN 3403.* Principles of firm financial management, financial markets, financial institutions, capital markets, firm growth, and analysis. Emphasis on markets and application of financial principles.

AEB 6174: Economic Coordination and Organizational Behavior (3) Analysis of the organization of economic activities across firms and markets, internal governance structures and the separation of ownership and control.

AEB 6182: Agricultural Risk Analysis and Decision Making (3) *Prereq: AEB 6106 or equivalent.* Review of conceptual framework

and research methods for analysis of decision making by agricultural producers. Expected utility theory, risk programming, stochastic dominance, and dynamic decision models.

AEB 6183: Agribusiness Risk Management (3) Examine and develop the applied risk analysis skills useful for risk management decision-making by agricultural producers, agribusinesses, and researchers.

AEB 6184: Economics of Agricultural Production (3) *Prereq: AEB 6182.* Producer decisions including theoretical and empirical problems of multi-factor, multi-product, and poly-period cases. Input demand and product supply functions at the commodity and industry levels.

AEB 6225: U.S. and World Food Systems (3) Economic policy process at national and international levels. Issues include structure of food system, food safety, and environmental impacts.

AEB 6240: Macroeconomic Theory in Open Economies II(3) Essential elements of macroeconomic theory and policy in world of interdependent nations.

AEB 6301: Food Wholesale and Retail Marketing (3) Wholesale and retail issues that exist both in U.S. and world markets, such as brand management, supermarket management, and market research.

AEB 6363: Agricultural Marketing (3) *Prereq: ECO 3101.* Economic theory of markets and its use. Development of time, form, space, and vertical dimensions of market price and factors that facilitate market operation.

AEB 6373: Consumption and Demand (3) Theories of Consumer Behavior in Static and Dynamic Contexts; analysis of household expenditure and demand.

AEB 6383: Industrial Organizations of Agricultural Markets (3) *Prereq: ECO 3100 or 3101.* Market structure, conduct, and performance. Evaluation of current public policy and institutional arrangements.

AEB 6385: Management Strategies for Agribusiness Firms (3) *Prereq: ECO 3101.* Planning, organizing, implementing, and evaluating the agribusiness management functions of strategic planning, finance, marketing, and personnel.

AEB 6413: Ecological Economics: Theory and Applications(3) Introduction to integration of economics and ecology with practical problem identification and analysis. Emphasis on student participation and projects.

AEB 6453: Natural Resource and Environmental Economics (3) *Prereq: ECO 3101 and 3203, or consent of instructor.* Resource use, management, development, and conservation. Institutional and market performance in providing socially desired outcomes.

AEB 6483: Seminar in Natural Resource and Environmental Economics (3) *Prereq: AEB 6453.* Application of economic methods to problems of environmental and regional development; input-output models, cost-benefit analysis, economic valuation, and development planning.

AEB 6533: Static and Dynamic Optimization Models in

Agriculture (3) *Prereq: ESI 4567.* Classical optimization models with emphasis on mathematical programming and applications. Introduction to dynamic optimization models.

AEB 6553: Elements of Econometrics (3) *Prereq: AEB 3103, 4511; STA 3023.* Econometric problem solving and determining quantitative relationships among economic variables in agriculture and related industries.

AEB 6571: Econometric Methods I (3) *Prereq: MAS 2103, STA 4322.* Linear and nonlinear econometric models, serial correlation, heteroscedasticity, errors in variables, qualitative variables, specification errors, and simultaneous equation models.

AEB 6572: Econometric Methods II (3) *Prereq: AEB 6571.* Topics in econometrics including single equation and multiple equation linear and nonlinear models.

AEB 6592: Mathematical Programming for Economic Analysis (3) Simplex method and primal-dual relationships in linear programming. Application of modeling techniques, such as separable, multi-objective, quadratic, and integer programming, to economic problems.

AEB 6645: Economic Development and Agriculture (3) *Prereq: ECO 3101 or AEB 3103.* Relation of human, capital, and natural resources, technology, and institutions to income growth and distribution. Development strategies in low-income countries.

AEB 6651: Agriculture's Role in Latin America and Africa (3) Socioeconomic development and strategies at the national, regional, and village level. Underdevelopment and cultural ecology.

AEB 6675: International Agribusiness Marketing (3) *Prereq: AEB 5188.* Principles, issues, barriers, policies, strategies, and decisions involved in global marketing and trade of perishable and storable agricultural commodities and food products.

AEB 6815: Science and Research Methodology (3) Role of science, philosophy, and scientific methods in food and resource economics research.

AEB 6817: Survey Research Methods for Economists(3) Process of creating, validating, implementing, coding, and interpreting results from economic surveys.

AEB 6905: Problems in Food and Resource Economics (1-3; max: 8) *Prereq: consent of instructor.* Individual study. Problems of interest to the student and agreeable to the instructor.

AEB 6910: Supervised Research (1-5; max: 5) S/U.

AEB 6921: Workshop in Food and Resource Economics I (1) *Prereq: AEB 6533.* Empirical applications of concepts developed in the microeconomic core.

AEB 6933: Special Topics (1-6; max: 6)

AEB 6934: Workshop in Food and Resource Economics II (1) Developing and understanding how to apply food and resource economic concepts to agricultural and resource related problems.

AEB 6942: Advanced Applications in Agribusiness Experience (1-3; max: 6) Applications of marketing, management, and finance principles to workplace station. Applications developed from approved internship.

AEB 6971: Research for Master's Thesis (1-15) S/U.
AEB 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
AEB 7980: Research for Doctoral Dissertation (1-15) S/U.

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Food Science and Human Nutrition

College of Agricultural and Life Sciences

Graduate Faculty

Chair: N. F. Shay. *Graduate Coordinator:* H. Sitren, M.D. Knutson.
Complete faculty listing by department: Follow this link

Programs are offered leading to the degrees of Master of Science and Doctor of Philosophy in food science and human nutrition. Minimum requirements for these degrees are given in the *General Information* section of this catalog.

The Ph.D. program includes an interdisciplinary Ph.D. in nutritional sciences or a concentration in food science. The M.S. program offers tracks in food science and in nutritional sciences. The Institute of Food Technologists and the American Society for Nutrition recognize these concentrations. The M.S. programs also include thesis and nonthesis options. The department also offers a combined Master of Science-Dietetics Internship (MS-DI) program accredited by the Commission on Accreditation for Dietetic Education (CADE). Students who complete this program are eligible to take the national registration examination to become a registered dietitian. Only graduates from a CADE accredited/approved Didactic Program in Dietetics are eligible for the MS-DI program.

Specific areas of study include nutritional biochemistry/molecular biology, nutrient function/metabolism, medical nutrition therapy/dietetics, nutritional immunology, food processing/engineering, food chemistry/biochemistry, and food safety/microbiology/quality.

Applicants must have an adequate background in physical and biological sciences and food science or nutritional sciences. Students with specific deficiencies will be required to take prerequisite courses.

DIE 6241: Advanced Medical Nutrition Therapy (3) *Prereq: admission to Master of Science-Dietetic Internship.* Opportunity to integrate theories and principles of medical nutrition therapy into clinical practice.
DIE 6242: Advanced Medical Nutrition Therapy II (4) *Prereq: admission to Master of Science-Dietetic Internship and DIE 6241.* Opportunity to integrate principles of medical nutrition therapy into clinical practice.
DIE 6516: Professional Development in Dietetics (2) *Prereq: DIE 6938. Coreq: DIE 6944.* Professional development assessment, planning, and evaluation for future dietetics professionals.
DIE 6905: Problems in Dietetics (1-3; max: 4) *Prereq: consent of instructor. Not open to students on probation or conditional admission.* Individual study and research carried out in community, hospital, or laboratory settings.
DIE 6938: Advanced Dietetic Seminar (1) *Prereq: admission to Master of Science-Dietetic Internship. Coreq: DIE 6942.* Problem-solving, leadership, and analytical skills.
DIE 6942: Dietetic Internship I (8-12; max: 12) *Prereq: DIE 6242. Coreq: DIE 6938.* Internship in dietetics in affiliated institutions offering core rotations in community nutrition, food systems management, and clinical dietetics. Emphasizes applying theory to practice. S/U.
DIE 6944: Dietetic Internship II (4-8; max: 12) *Prereq: DIE 6942.* Internship in affiliated institutions offering elective and/or specialty rotations (e.g., nutrition support, diabetes, pediatrics, sports nutrition, wellness, advanced food systems, and staff experience). Emphasizes skill development for entry-level practice. S/U.
DIE 6949: Dietetic Internship in Sports Nutrition (4; max: 15) *Prereq: admission to the sports nutrition emphasis of the combined Master of Science-Dietetic Internship (MS-DI) program.* Sports nutrition internship. Emphasizes developing competency in conducting, managing, and supervising nutrition care services for intercollegiate athletes. S/U.
FOS 5205: Current Issues in Food Safety and Sanitation (3) Microbial, chemical, and biological safety of food; principles of sanitation for food processing and retail food industries.
FOS 5225C: Principles in Food Microbiology (4) *Prereq: MCB 3020 or consent of instructor.* Fundamental aspects of biological contamination and its control during harvesting, processing, and storage of foods. Analysis of microbial food fermentation, microbial ecology of foods, selection of methods to examine foods for microbial content.
FOS 5437C: Food Product Development (3) *Prereq: 4000-level food science course, or consent of instructor.* Value-added food

products. Technology, safety, health/nutrition, legal, quality, and economic/marketing considerations.

FOS 5561C: Citrus Processing Technology (3) *Prereq: undergraduate course in food processing.* Grading, inspection, sampling, extraction, and concentration of citrus products. Emphasizes manufacturing and quality assurance. Taught partly at Lake Alfred Citrus Research and Education Center.

FOS 5732: Current Issues in Food Regulations (3) *Prereq: consent of instructor.* Governmental laws and regulations affecting the food industry.

FOS 6125C: Sensory Evaluation of Food (3) *Prereq: STA 6166.* Principles and techniques of sensory evaluation of foods. Emphasizes basics of taste and olfactory perception; the basic psychology of common sensory tests; the proper use of discrimination testing, consumer acceptability and preference testing, and descriptive analysis; and statistical analysis of sensory data.

FOS 6126C: Psychophysical Aspects of Foods (3) *Prereq: FOS 4311C and 4722C.* Physical and chemical stimuli controlling human sensory perception of texture, color, and flavor of foods.

FOS 6226C: Advanced Food Microbiology (4) *Prereq: FOS 4222/4222L, MCB 4303/4303L and BCH 6415.* Selection of laboratory methods, characterization of food-borne pathogens and spoilage organisms.

FOS 6315C: Advanced Food Chemistry (4) *Prereq: BCH 4024 or 3025 and FOS 4311C.* Functions of lipids, carbohydrates, proteins, enzymes and other components in foods and their reactions and interactions during food processing and storage.

FOS 6317C: Flavor Chemistry and Technology (3) *Prereq: basic and organic chemistry.* Psychophysics of taste and aroma, sensory analysis, flavor extraction, measurement techniques, flavor precursors, off-flavors, Maillard flavors, bioflavors, flavoring materials, flavor safety and authenticity.

FOS 6355C: Instrumental Analysis and Separations (5) *Prereq: CHM 3120, FOS 4311C.* Separation of food chemicals; gas, high performance liquid, thin-layer, ion-exchange and molecular size chromatography; characterization via UV-visible, IR, NMR, and mass spectrometry.

FOS 6428C: Advanced Food Processing (4) *Prereq: FOS 4427C.* Reaction kinetics, heat transfer mechanics, and process design, optimization and economics.

FOS 6455C: Industrial Food Fermentations (3) *Prereq: FOS 4222/4222L.* Microbiological, chemical, and physical principles and practices in fermentation of foods and constituents.

FOS 6646: Proteins and Enzymes in Food Systems (4) *Prereq: FOS 6315C.* Structure, function, and analytical techniques for proteins and enzymes in food systems.

FOS 6648: Carbohydrates in Food Systems (2) *Prereq: FOS 6315C or equivalent.* Structure, physical and chemical properties of carbohydrates, and their analysis, function, and reactivity in food systems.

FOS 6905: Problems in Food Science (1-3; max: 4) *Prereq:*

consent of instructor. Not open to students on probation or conditional admission. Individual study carried out in laboratory, library, pilot plant, or the food industry.

FOS 6910: Supervised Research (1-5; max: 5) *Prereq: consent of instructor.* S/U.

FOS 6915: Research Planning (2) *Prereq: consent of instructor.* Required of first-year graduate students. Planning and initiating research, experimental techniques, analyzing data, reporting results.

FOS 6936: Topics in Food Science (1-4; max: 8) *Prereq: consent of instructor.* Special aspects or current developments in food science.

FOS 6938: Food Science Seminar (1; max: 4) *Prereq: consent of instructor.* Preparing and presenting reports on specialized aspects of research and technology in food science.

FOS 6940: Supervised Teaching (1-5; max: 5) *Prereq: consent of instructor.* S/U.

FOS 6971: Research for Master's Thesis (1-15) S/U.

FOS 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

FOS 7980: Research for Doctoral Dissertation (1-15) S/U.

HUN 5246: Current Issues in Dietary Supplements (2) *Prereq: HUN 2201 or consent of instructor.* Federal laws and regulations covering definition, marketing, and labeling of dietary supplements. Discusses specific vitamins, minerals, herbs, and ergogenic aids. Reviews scientific literature and public information.

HUN 5441: Metabolic Response to Enteral and Parenteral Nutrition (2) *Prereq: BCH 3025, HUN 2201, and PET 2350 or equivalents.* Response of the body's organ systems to enteral and parenteral nutritional support, emphasizing physiological and biochemical adaptations.

HUN 5447: Nutrition and Immunity (3) *Prereq: PCB 4713C.* Role of nutrition in immunity. Effect of nutrients, foods, and dietary supplements on regulation of the immune system.

HUN 6245: Advanced Human Nutrition (3) *Prereq: BCH 4024 or 3025, and a nutrition principles course.* Molecular and cellular aspects of nutrients and discussion of research techniques in genomics and proteomics.

HUN 6255: Clinical Nutrition(2-12; max: 12) Nutritional requirements and metabolism of nutrients in normal individual, altered nutritional requirements and metabolism of nutrients in different disease states, and practical aspects of nutritional and metabolic support of different types of patients.

HUN 6301: Nutritional Aspects of Lipid Metabolism (3) Role of lipids in nutrition, with emphasis on energy metabolism and derangements in chronic diseases.

HUN 6305: Nutritional Aspects of Carbohydrates(3) Characteristics, absorption, and metabolism of common carbohydrates in the food chain; carbohydrate metabolism and its

regulation; carbohydrate metabolism in disease.

HUN 6321: Proteins and Amino Acids in Nutrition (4) *Prereq: BCH 3025.* Digestion, absorption, and degradation; emphasis on turnover, requirements, assessment of quality, and effects of deficiencies, toxicities, and physiological stresses.

HUN 6331: Vitamins in Human Nutrition (3) *Prereq: BCH 4024 or 3025.* Biochemical and physiological functions; nutrient requirements and interactions; response to deficiencies and excesses.

HUN 6356: Minerals in Nutrition (3) *Prereq: BCH 4024 or equivalent.* Biochemical and physiological aspects of mineral absorption, metabolism, and function.

HUN 6812C: Analytical Techniques in Nutritional Biochemistry (1) *Prereq: BCH 4024 or 3025 and consent of instructor.* Biochemical analyses of tissues and fluids, radio-tracer methodology, metabolic studies, tissue handling, and formulation of experimental animal diets.

HUN 6905: Problems in Nutritional Sciences (1-3; max: 4) *Prereq: consent of instructor. Not open to students on probation or conditional admission.* Individual study carried out in laboratory, library, pilot plant, or food industry.

HUN 6910: Supervised Research (1-5; max: 5) *Prereq: consent of instructor.* For nonthesis students only. S/U.

HUN 6936: Topics in Nutritional Sciences (1-4; max: 8) *Prereq: consent of instructor.* Special aspects or current developments in nutritional sciences.

HUN 6938: Nutritional Sciences Seminar (1; max: 4) *Prereq: consent of instructor.* Presentation of reports on research in nutrition.

HUN 6939: Advanced Clinical Nutrition (2-12 ; max: 12) Applying normal and therapeutic nutrition principles to specific clinical topics based on cases from the health center environment.

HUN 6940: Supervised Teaching (1-5; max: 5) *Prereq: consent of instructor.* S/U.

HUN 6971: Research for Master's Thesis (1-15) *Prereq: for thesis students only.* S/U.

HUN 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

HUN 7980: Research for Doctoral Dissertation (1-15) S/U.

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Forest Resources and Conservation

College of Agricultural and Life Sciences

Graduate Faculty

Director: T. L. White. *Graduate Coordinator:* C. Cichra, G. M. Blakeslee Jr.. *Complete faculty listing by department*: Follow this link

The School offers programs leading to the Master of Forest Resources and Conservation (professional, nonthesis), Master of Science (with thesis), and Doctor of Philosophy degrees in forest resources and conservation. Requirements for these degrees are given in the *General Information* section of this catalog.

Specializations include agroforestry, biometrics, biotechnology, ecology, economic sustainability, ecotourism, environmental education, fire science, forest economics, forest genetics, forest nutrition, geographic information systems, geomatics, hydrology, international forestry, management operations, pathology, physiology, policy, reforestation, remote sensing, resource management, silviculture, soils, tropical forestry, and urban forestry.

Graduate students should have appropriate undergraduate training in biological, social, and physical sciences. Students with inadequate backgrounds may still be admitted but will be required to take appropriate undergraduate courses to support their fields of study. All graduate students are required to develop teaching skills by assisting with one course during their programs.

Joint program: Students may simultaneously earn a juris doctorate from the College of Law and a graduate degree (M.F.R.C., M.S., or

Ph.D.) in forest resources and conservation.

Combined programs: The School offers a combined bachelor's/master's degree program, which allows qualified students to earn both a bachelor's degree and a master's degree with a savings of 1 semester. Ph.D. students may pursue a co-major with the Department of Statistics (see below).

Concentration in geomatics: Students completing 15 or more credits with an SUR designation, as part of an SFRC graduate degree, may earn the concentration in geomatics. Geomatics is the collection, analysis, and management of spatial information and includes such fields as surveying, mapping, land tenure, cadastral systems, geographic information systems, and remote sensing.

Statistics co-major: Ph.D. students with the School may elect the co-major offered jointly with the Department of Statistics. Students focusing on forest genetics, tree improvement, and other statistics-intensive aspects of natural resource management are potential candidates for this option.

Certificates: The School administers the Graduate Certificate in Agroforestry, and SFRC students regularly earn certificates in Geographic Information Systems and in Environmental Education and Communication. Requirements are described under *Interdisciplinary Graduate Certificates and Concentrations* in this catalog.

For additional information, visit the School's web page at http://www.sfrc.ufl.edu.
For details on what terms courses will be offered, visit, http://www.sfrc.ufl.edu/gcourses.html.

FNR 5072C: Environmental Education Program Development (3) Comprehensive approach, from needs assessment to evaluation, applied to youth-based, nonformal environmental education. Required field trip and group project. Offered fall term of odd-numbered years.
FNR 5335: Agroforestry (3) Biological, ecological, socioeconomic, and technical-managerial aspects of tree/crop, tree/animal, and tree/crop/animal systems. Examples of traditional and modern, rotational, and intercropped systems, and analyses of their structure, functioning, and potentials, with special reference to the tropics and subtropics. Offered spring term.
FNR 5462: Spatial Models and Decision Analysis () *Prereq: FOR 3434C, basic statistics, or instructor permission.* Environmental modeling in a spatial context using descriptive and prescriptive tools and spatial reasoning.
FNR 5608: Research Planning (3) *Prereq: consent of instructor. Required for all new M.S. students.* History and philosophy of science, scientific method, development of a research proposal.

Research facilities and programs are presented. Offered fall term.

FOR 5157: Ecosystem Restoration Principles and Practice (3) Application of ecological theory and economic and political constraints to restoration practice. Emphasizes regional, national, and international case studies.

FOR 5159: Ecology and Restoration of Longleaf Pine Ecosystems (3) History, structure, function and ecological and economic importance; regeneration ecology, stand dynamics, restoration techniques, ownership patterns, and socio-economic and political and policy aspects of restoration

FOR 5161: Forest Productivity and Health (3) *Prereq: consent of instructor.* Silviculture, disease management, and genetic improvement. Stand development and composition, competition, growth-limiting factors, epidemiology, choice of species and provenance, and tree breeding. Offered spring term of odd-numbered years.

FOR 5435: Forest Information Systems (3) *Prereq: consent of instructor.* Sampling methodology for natural resource inventories, involving remote sensing, geographic information systems (GIS), and global positioning system (GPS). Offered spring term of even-numbered years.

FOR 5615: Forest Conservation and Management Policies and Issues (3) Current policies in North America and internationally. Historical patterns of resource use and policy response are reviewed as a basis for evaluating current issues. Offered fall term.

FOR 5625: Forest Water Resources Management (3) *Prereq: SOS 3022.* Forest Management practices in relation to hydrologic responses and water quality considerations.

FOR 5756: Non-Timber Forest Products (3) Intensive review of non-timber forest products worldwide, and how forests are managed to provide these products.

FOR 6005: Conservation Behavior (3) Methods for changing behavior in various groups to improve environmental sustainability.

FOR 6154: Analysis of Forest Ecosystems (3) *Prereq: graduate status or consent of instructor.* Energy, water, carbon and nutrient fluxes in forests; applications to forest and landscape management. Offered spring term of even-numbered years.

FOR 6156: Simulation Analysis of Forest Ecosystems (3) Conceptual basis, evaluation, implementation, testing, and analysis of forest simulation models. Students develop and present modeling projects.

FOR 6164C: Silviculture: Concepts and Application (3) *Prereq: course in ecology.* Principles governing establishment, treatment, and control of forest stands; regeneration systems; intermediate cuttings; intensive cultural practices; land use ethics; and management systems.

FOR 6170: Tropical Forestry (3) *Prereq: consent of instructor.* Promise and pitfalls of production-oriented management as a conservation strategy for naturally regenerated tropical forests. Ecological constraints to sustainable forest management in the tropics; strategies, tools, and techniques for large- and small-scale

management of old growth and secondary tropical forests for timber and non-timber forest products and services; future of forests and forestry in tropical landscapes. Offered spring term.

FOR 6172C: Tropical Forestry Field Course(2) Taught in Amazon Basin of Brazil. Emphasis on appreciation of practical considerations inherent in tropical forestry issues, including challenges/opportunities for improvement. Supplemental fee required.

FOR 6310: Forest Genetics and Tree Improvement (3) Review of Mendelian, population, and quantitative genetics as important in natural forests and breeding programs of forest trees. Principles of tree improvement programs, gene conservation, and breeding strategy development for a wide variety of tree species. Offered fall term of odd-numbered years.

FOR 6340: Physiology of Forest Trees (3) *Prereq: graduate status or consent of instructor.* Growth and development of woody perennial plants, with emphasis on understanding how environmental factors affect their physiology. Offered fall term of odd-numbered years.

FOR 6345C: Plant Water Relations Techniques(2) *Prereq: consent of instructor.* Instruments and techniques to quantify water balance/status of plants in field. Emphasis on theory, assumptions, and pros and cons of techniques.

FOR 6543: Valuation of Forest Resources (3) *Prereq: consent of instructor.* Extending microeconomic principles to problems in forest production, supply behavior, forest valuation, and multiple use of forest lands. Offered spring term of odd-numbered years.

FOR 6628: Community Forest Management (3) Integrates theory from the socio-economic and bio-physical sciences with on-the-ground realities in implementing community-based forest management and conservation.

FOR 6665: Landscape Planning for Ecotourism (3) Planning frameworks and techniques of large natural areas. Offered fall term.

FOR 6905: Research Problems in Forest Resources and Conservation (1-6; max: 10) *Prereq: consent of instructor.*

FOR 6910: Supervised Research (1-5; max: 5) *Prereq: consent of instructor.* S/U.

FOR 6933: Seminar (1; max: 2) .

FOR 6934: Topics in Forest Resources and Conservation (1-4; max: 10) Selected topics in forestry and natural resources.

FOR 6940: Supervised Teaching (1-5; max: 5) *Prereq: consent of instructor.* S/U.

FOR 6971: Research for Master's Thesis (1-6) S/U.

FOR 7979: Advanced Research (1-15) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

FOR 7980: Research for Doctoral Dissertation (1-15) S/U.

PCB 5530: Plant Molecular and Cellular Biology (3) *Prereq: undergraduate molecular biology or biochemistry.* Integrated

overview of the fundamental mechanisms enabling plant growth, development, and function, and approaches to study these at molecular level. Topics include replication, repair, transcription, translation, cell cycle, transformation, gene tagging, structural genomics, proteomics, and metabolomics. Offered in fall term.

PCB 6528: Plant Molecular Biology (3) *Prereq: BCH 6415 and PCB 5065 or equivalents.* Cellular and developmental biology of plants. Lecture format with frequent discussion of recent papers. Topics include signal transduction, organelles, protein trafficking, and developmental mechanisms. Offered in spring term.

PCB 6555: Introduction to Quantitative Genetics (3) *Prereq: STA 6166.* Intended for students of all disciplines who are interested in genetic principles and biometric evaluation of characters that exhibit continuous variation in natural populations or breeding programs.

SUR 5365: Digital Mapping (3) *Prereq: consent of instructor.* Methods of digital representation of maps, coordinate development, digitizing, stereocompilation, scanning, remote sensing, hardware and software systems, file conversion, integration into GIS systems, and attribute development.

SUR 5385: Remote Sensing Applications (3) *Prereq: consent of instructor.* Review of remote sensing systems, image classification methods, mapping applications, integration of remotely sensed data into GIS systems, application of data for variety of land information systems.

SUR 5391C: Geomatics: Spatial Foundations of GIS (3) *Prereq: consent of instructor.* Application of Geomatics technologies (GPS, Total Station, Level) to create a database. Includes database design, data transfer, and spatial analysis.

SUR 5425: Cadastral Information Systems (3) *Prereq: consent of instructor.* Methods of cadastral mapping for tax and/or GIS applications; interpretation of deed and survey information, the sectional survey system, conflict resolution, cadastral information.

SUR 5525: Least Squares Adjustment Computations (3) *Prereq: proficiency in computer language and consent of instructor.* Implementation of least squares solutions for survey-mapping and GIS applications, time and storage optimization; error analysis; initial approximation generation; robust estimations; and computer programming.

SUR 5625: Geographic Information Systems Analysis (3) *Prereq: introductory GIS course.* Analytical tools such as software grid modules, database query, map algebra, and distance operators; analytical operations such as database query, derivative mapping, and process modeling; sources and nature of uncertainty and error, and project planning management.

SUR 6375: Terrain Analysis and Mapping (3) *Prereq: consent of instructor.* Digital and visual methods, interpretative techniques to identify landforms, soils, and potential site-analysis problems from aerial photography and digital maps.

SUR 6395: Topics in Geographic Information Systems (3) *Prereq: consent of instructor.* Database development, economic

impact of GIS, development of standards, integration of data sets, hardware and software developments, and advances in GIS technology.

SUR 6427: Land Tenure and Administration (3) *Prereq: graduate status.* Origins of property rights, common vs. individual property. Indigenous tenure systems in Africa and Latin America and their evolution. Process and benefits of property formalization.

SUR 6535: GPS-INS Integration(3) *Prereq: Background in vector calculus and matrix algebra* Principles of inertial navigation and its integration with GPS; coordinate frames, modeling linear motion and rotational motion, mechanization of inertial navigation sensor measurements, space state representation of system errors and linear state equations.

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Genetics and Genomics

Interdisciplinary

Chair and Graduate Coordinator: W. Vermerris.
Complete faculty listing by department: Follow this link

The University of Florida Genetics Institute is a multi-college, multi-faceted research center. Good geneticists are integrative geneticists, who incorporate many different subfields of genetics into their work. The core mission is to improve the quality of life of people throughout the world via integrative, genetics-based research. Accordingly, faculty interests and graduate research opportunities include a wide range of areas from advances in gene therapy to understanding the maintenance of genetic variation, from understanding plant immune responses to developing improved algorithms for identifying regulatory motifs in DNA sequences, and from the challenges of bioethics to strategies for controlling malaria.

The highlight of the first year core training is the research rotations program. Student laboratory rotations are a particularly exciting feature of the genetics and genomics doctoral program, and epitomize the philosophy that good geneticists are broadly trained and integrative. Many current Graduate Faculty members still vividly recall the transforming effects of their rotations during graduate school--they didn't always end up where they expected! Rotations can open students' eyes to areas of genetics that they had never considered and entice them into considering brand new career opportunities. Each student will sample the breadth and depth of genetics research at UF by carrying out three 8-week

modules consisting of design, implementation, and analysis of genetics experiments. Each rotation is conducted in close association with a Graduate Faculty member. To ensure that students fully experience the impressive breadth of genetics research at UF, their rotations are hosted by Graduate Faculty in at least two different colleges. Students will also take PCB 5065, Advanced Genetics; GMS 6181, Special Topics in Microbiology (among the topics are genomics and bioinformatics, and ethics for genetics research); STA 6166, Statistical Methods I; and other electives as desired. In addition, throughout their tenure in the program, students participate in the Genetics Seminar, which is an opportunity to present their rotation plans and results of research to faculty and other students.

Prospective students should have strong backgrounds in biology and other hard sciences. Exceptional students with other backgrounds will also be considered. The research statement required as part of the application has a particularly important part in the admissions decision. Each applicant must describe his/her research interests, so that Graduate Faculty can evaluate knowledge of the discipline, fit to the program, and ability to articulate and motivate an interesting research problem. The required letters of recommendation are also extremely important in helping identify applicants with exceptional aptitude for genetics, and with research experience and promise.

For more information, write to the Genetics and Genomics Graduate Program, Attn: Graduate Secretary, Genetics Institute, University of Florida, PO Box 100196, Gainesville, FL 32610-0196. Expanded information can be found at http://www.ufgi.ufl.edu.

AGR 6322: Advanced Plant Breeding (3) *Prereq: AGR 3303, 4231, 6311, and STA 6167.* Theory and use of biometrical genetic models for analytical evaluation of qualitative and quantitative characteristics, with procedures applicable to various types of plant species. Offered spring term in even-numbered years.
ANG 6469: Molecular Genetics of Disease (3) Examines the molecular genetics of human disease. Discusses a range of diseases from single-gene recessive defects (such as cystic fibrosis) to complex diseases (such as alcoholism and diabetes). Also discusses detection and treatment.
ANG 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
ANG 7980: Research for Doctoral Dissertation (1-15) S/U.
BCH 6415: Advanced Molecular and Cell Biology (3) *Prereq: BCH 4024, CHM 4207, MCB 4303, or consent of instructor. PCB 3063 or a similar course in genetics recommended. One of three core biochemistry courses.* Molecular biology of pro- and eukaryotic organisms. Emphasizes understanding the experimental approaches

that led to recent developments. Chromosome structure and organization, advances in recombinant DNA technology, DNA replication, RNA transcription and protein synthesis, and selected aspects of molecular regulation of gene expression.

BCH 7410: Advanced Gene Regulation (1; max: 3) *Prereq: GMS 6001 or consent of instructor.* Literature-based assessment of the most recent advances in factors governing eukaryotic gene regulation.

CAP 5510: Bioinformatics (3) *Prereq: CIS 3020 or equivalent.* Basic concepts of molecular biology and computer science. Sequence comparison and assembly, physical mapping of DNA, phylogenetic trees, genome rearrangements, gene identification, biomolecular cryptology, and molecular structure prediction.

CAP 5515: Computational Molecular Biology (3) Algorithms related to molecular biology. Sequence comparisons, pattern matching, pattern extraction, graph techniques in phylogeny construction, secondary structure prediction, multiple sequence alignment, contig search, DNA computing, computational learning theory, and genetic algorithms.

CAP 5805: Computer Simulation Concepts (3) *Prereq: COP 3530.* Introduction to concepts in continuous and discrete simulation. Emphasizes fundamental concepts and methodology, using practical examples from a wide variety of disciplines.

CIS 6930: Special Topics in CIS (3; max: 9) *Prereq: vary depending on topics.*

COT 5405: Analysis of Algorithms (3) *Prereq: COP 3530.* Introduction and illustration of basic techniques for designing efficient algorithms and analyzing algorithm complexity.

FOR 6310: Forest Genetics and Tree Improvement (3) Review of Mendelian, population, and quantitative genetics as important in natural forests and breeding programs of forest trees. Principles of tree improvement programs, gene conservation, and breeding strategy development for a wide variety of tree species. Offered fall term of odd-numbered years.

FOR 6934: Topics in Forest Resources and Conservation (1-4; max: 10) Selected topics in forestry and natural resources.

FOR 7979: Advanced Research (1-15) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

FOR 7980: Research for Doctoral Dissertation (1-15) S/U.

GMS 6011: Mouse Genetics (1; max: 3) *Prereq: GMS 6001 or consent of instructor.* Theoretical framework for understanding the fundamentals of mouse genetics and use of the mouse model to study human disease. Advanced technical tools used for research and their application to novel problems.

GMS 6012: Human Genetics (1; max: 3) *Prereq: GMS 6001 or consent of instructor.* Theoretical framework for understanding the fundamentals of human genetics. Advanced technical tools used for research.

GMS 6013: Developmental Genetics (1; max: 3) *Prereq: GMS 6001 or consent of instructor.* Theoretical framework for understanding the fundamentals of developmental genetics. Advantages and limitations of several model systems and their application to the study of development.
GMS 6014: Applications of Bioinformatics to Genetics (1) *Prereq: GMS 6001; consent of instructor.* Storage, retrieval, and analysis of information related to genetics.
GMS 6015: Human Genetics II (1) *Prereq: GMS 6012; consent of instructor.* Theoretical framework, emphasizing functional genomics and bioinformatics. Advanced technical tools used for research and development in these areas.
GMS 6059: Gene Therapy from Bench to Bedside (1) *Prereq: GMS 6034, 6035, and 6036 or consent of instructor.* Designing and using gene transfer vectors to treat various diseases. Understanding the practical successes and hurdles of gene therapy.
GMS 6920: Genetics Journal Colloquy (1; max: 12) *Prereq: consent of instructor.* Critical presentations and discussions of recent original articles. S/U.
GMS 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
GMS 7980: Research for Doctoral Dissertation (1-15) S/U.
HOS 6201: Breeding Perennial Cultivars (3) *Prereq: AGR 3303.* Methods of breeding perennial fruit and ornamental cultivars using mutations, cell and tissue culture, polyploidy, recurrent selection, and wide hybridization. Conservation and domestication of wild plants. Offered odd-numbered years in fall.
PCB 5065: Advanced Genetics(4) *Prereq: AGR 3303 or PCB 3063 and BCH 4024 or 5045. For graduate students in any life science discipline.* Examines genetic principles including gene and gene function; recombination and linkage; molecular markers, multipoint linkage analysis, and positional cloning; and quantitative, population, developmental, and non-Medalian genetics. Offered in fall term.
PCB 5235L: Experiments in Immunology (1) *Prereq: MCB 3020L. Coreq: PCB 5235.* Basic seriological procedures in immunology.
PCB 5615: Molecular Evolution and Systematics (4) *Prereq: PCB 3063, graduate standing, or consent of instructor.* Patterns and processes of change at the molecular level in populations, species, and higher taxonomic groups, and their systematic implications.
PCB 6528: Plant Molecular Biology (3) *Prereq: BCH 6415 and PCB 5065 or equivalents.* Cellular and developmental biology of plants. Lecture format with frequent discussion of recent papers. Topics include signal transduction, organelles, protein trafficking, and developmental mechanisms. Offered in spring term.
PCB 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with

a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

PCB 7980: Research for Doctoral Dissertation (1-15) S/U.

STA 5325: Fundamentals of Probability(3) *Prereq: grade of C or better in MAC 2313 and STA 3032 or equivalent.* Topics in probability and statistics, particularly discrete and continuous random variables, sampling distributions, estimation, and hypothesis testing. Applications to engineering and natural science.

STA 5328: Fundamentals of Statistical Theory (3) *Prereq: STA 4321 or equivalent.* Direct continuation of STA 4321/STA 5325. Basic material for distribution theory, sampling distributions, properties of estimators, hypothesis testing, linear regression analysis, and analysis of variance. A good knowledge of calculus is helpful.

STA 6166: Statistical Methods in Research I (3) *Prereq: STA 2023 or equivalent.* Statistical methods based on t, F, and Chi^2 tests. Analysis of variance for basic experimental designs. Factorial experiments. Regression analysis and analysis of covariance.

STA 6167: Statistical Methods in Research II (3) *Prereq: STA 6166.* Analysis of covariance and general linear model. Factorial, nested, split-plot, and incomplete block designs. Analysis of count data.

STA 6178: Genetic Data Analysis (3) *Prereq: STA 6327.* Biological and molecular basis. Likelihood ratio test, multinomial distribution and Bailey's theorem. Linkage analysis of qualitative traits. Twin and sibling studies. Computing the kinship coefficient by the matrix method. Mapping quantitative trait loci by EM algorithm. Heritability. Breeding value prediction using flanking markers with variance component analysis. Linkage disequilibrium analysis for gene mapping. Forensic genetics using Bayes' formula. Genetic counseling. Gene pattern matching and constructing evolutionary trees by cluster analysis.

STA 6207: Basic Design and Analysis of Experiments (3) *Prereq: STA 6208 Regression Analysis.* Principles of experimental design, completely randomized design (analysis, contrasts, diagnostics), random effects models, factorial experiments (fixed, random, and mixed effect), block designs, Latin squares, split plots, and full and fractional factorial experiments.

STA 6329: Matrix Algebra and Statistical Computing(3) *Prereq: MAC 3313.* Basic theory of determinants, inverses and generalized inverses, eigenvalues and eigenvectors; applications of partitioned matrices; diagonalization and decomposition theorems; applications in least squares.

STA 6934: Special Topics in Statistics (1-3; max: 12) *Prereq: permission of graduate adviser.*

STA 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

STA 7980: Research for Doctoral Dissertation (1-15) S/U.
ZOO 6927: Special Topics in Zoology (1-4; max: 15)
ZOO 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been admitted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
ZOO 7980: Research for Doctoral Dissertation (1-15) S/U.

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Geography

College of Liberal Arts and Sciences

Graduate Faculty

Chair: N. J. Smith. *Graduate Coordinator:* J. Southworth.
Complete faculty listing by department: Follow this link

The Department of Geography offers the Master of Arts, Master of Science, and Doctor of Philosophy degrees. Complete descriptions of the minimum requirements for these degrees are provided in the *General Information* section of this catalog.

The Department provides three main areas of specialization for graduate research: economic and business geography and policy; resource management and land use and land cover change; and physical geography. Economic and business geography and policy concerns such topics as technological change; entrepreneurship; spatial economic theory; historic places; population change and housing patterns; housing and care of the elderly; behavioral geography; and internal urban structure. Resource management and land use and land cover change focus on agricultural change and resource conservation and development in the tropics and subtropics, and rural and urban land use and land cover change in tropical and temperate regions. Africa and Latin America are the primary areas of regional emphasis. Physical geography in the Department concentrates on climatology, coastal management, fluvial geomorphology, and hydrology. The Department's extensive geographic information system, remote sensing, and computer cartography teaching and research facilities contribute to and support all of the areas of research. Faculty from the Department are also major participants in the Land Use and Environmental

Change Institute (L.U.E.C.I.), which incorporates the major perspectives of geography in a multidisciplinary international scientific initiative. Prospective students should examine the research interests of the Graduate Faculty to obtain a more detailed sense of the Department's specialties (see the departmental website: www.geog.ufl.edu).

To ensure the incorporation of relevant interdisciplinary perspectives in each student's program, the Department maintains close ties with other departments in Liberal Arts and Sciences, and with programs in Latin American studies, urban and regional studies, tropical agriculture, tropical ecology, gerontological studies, water resources, the College of Education, and the Warrington College of Business Administration. Certificates in certain of these fields may be obtained in addition to graduate degrees in geography.

A graduate student should preferably have an undergraduate major in geography, but applicants with degrees in one of the social or physical sciences are accepted into the Department's graduate program. Deficiencies in undergraduate work in geography must be corrected concurrently with registration in graduate level courses. All students in the graduate program are required to take courses in contemporary geographic thought and geographic research skills.

The Department offers a combined bachelor's/master's degree program. Contact the graduate coordinator for information.

GEA 6419: Seminar: South America (3) Cultural, economic, political, and resource characteristics and development of representative areas.
GEA 6466: Seminar on Geography of Amazonia (3) Exploration of biophysical basis of natural resource management, cultural diversity, and economic development in Amazonia.
GEA 6468: Resource Utilization and Conservation in Latin America(3) Regional appraisal of human and natural resources. Analysis of role of resource utilization and conservation in development of Latin American countries.
GEO 5346: Natural Hazards (3) Multidisciplinary analysis of natural and man-induced environmental catastrophes. Their perception and institutional adjustments.
GEO 5556: Geography of Innovation and Technological Change (3) Generation, development, and spread of innovations by individuals, corporations, and organizations. Emphasizes the impact of innovations and technology on regional development and change.
GEO 5605: Advanced Urban Geography (3) Theoretical and planning literature that examines the locational and environmental issues confronting contemporary North American urban populations.
GEO 5809: Geography of World Agriculture (3) World distribution of crops and livestock related to natural and cultural conditions. Agricultural problems related to products, economic organization, agricultural regions, and the significance of world

affairs.

GEO 5905: Individual Study: Directed Reading (3; max: 12 including GEO 6905)

GEO 5920: Geography Colloquium (1; max: 6) Presentation and discussion of contemporary geographic research. S/U.

GEO 5945C: Field Course in Geography (3) Methods of geographical fieldwork. Observation, classification, interpretation, note-taking, traversing, and mapping of data. Aerial analysis; landforms, climate, vegetation, soils, resources, settlement patterns, and land use.

GEO 6118: Contemporary Geographic Thought and Research (3) *Prereq: admission to graduate program in geography.* Summary of major currents of intellectual thought and research orientations in contemporary geography.

GEO 6160: Introduction to Quantitative Methods for Geographers (3) *Prereq: statistics.* Working knowledge of statistical and quantitative techniques used by geographers. Focuses on spatial analysis.

GEO 6161: Intermediate Quantitative Methods for Geographers (3) *Prereq: GEO 6160.* Statistical techniques used in the spatial and social sciences. Regression analysis for cross-sectional, qualitative, time-series, and geocoded data.

GEO 6348: Floods Seminar (3) Analysis of the world's most extreme floods from the Pleistocene through present due to various causes. Emphasizes physical and human aspects of flood warning, preparedness, response and recovery throughout the world.

GEO 6375: Land Change Science Seminar (3) Interdisciplinary study of land use and land cover change dynamics and their relationship with global environmental change.

GEO 6429: Seminar: Cultural Geography (3) Review of literature, theoretical frameworks, and research design formulation in contemporary cultural geography.

GEO 6435: Seminar in Population (3) Combination lecture and seminar dealing with social and population problems from a spatial perspective. Major research project required.

GEO 6495: Environment and Behavior (3) *Prereq: graduate standing.* Theoretical and empirical analysis of how people perceive and interpret ordinary environments and their influence on well being.

GEO 6509: Seminar in Business Geography (3) *Prereq: consent of instructor.* Selected problems in geography of economic activity.

GEO 6558: Geography of Inequality in Africa(3) Socioeconomic inequality and uneven development in Africa. Economic polarization and rising inequality in social domains.

GEO 6905: Individual Work (1-5; max: 12 including GEO 5905)

GEO 6921: How to Survive and Thrive in Academia (1) Strategies and approaches, from preparation in graduate school, to success on the academic job market, to getting tenure.

GEO 6931: Seminar in Cultural and Political Ecology (3) Human-environment relationships from the perspective of cultural

and political ecology.
GEO 6938: Selected Topics in Geography (1-5; max: 15) *Prereq: graduate standing in geography or a related field.*
GEO 6971: Research for Master's Thesis (1-15) S/U.
GEO 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
GEO 7980: Research for Doctoral Dissertation (1-15) S/U.
GIS 5008C: Maps and Graphs (4) *Prereq: graduate standing.* General introduction to principles and techniques of thematic cartography and cartographic applications.
GIS 5009C: Advanced Cartography (3) *Prereq: GEO 4100C; CGS 3460 or consent of instructor.* Advanced methods including computer cartography and elements of cartographic reproduction.
GIS 5028C: Advanced Air Photo Interpretation (3) *Prereq: GEO 2200 or consent of instructor.* Uses of aerial photographs in geographical research.
GIS 5038C: Remote Sensing (4) *Prereq: GEO 4120C.* Uses of remote sensing imagery in geographical research.
GIS 5107C: Geographic Information Systems in Research (4) *Prereq: GEO 3162C or equivalent.* Geographic technology for creating, modifying, displaying, and analyzing spatial information. Geographic analysis and reasoning, computer software and hardware technology, and research applications of GIS. Geographic databases.
GIS 5127: Analysis of Thematic Data Quality (3) *Prereq: graduate standing; basic knowledge of GIS.* Evaluation and resolution of quality problems affecting thematic (non-base map) geographic attribute data.
GIS 5306: Geographic Information Systems Applications in Environmental Systems (3) *Prereq: GEO 3171 or equivalent, consent of instructor.* Advanced study of applying GIS to research problems in geosciences, landscape ecology, and land management. Concepts, methods, data, and models for studying physical and ecological spatial patterns and processes. Not software-specific.
GIS 5540: Business Geography and New Real Estate Market Analysis (3) *Prereq: GEO 3171 or equivalent, consent of instructor.* Methods that professional human economic geographers have used in the business community, starting with William Applebaum and extending through the contemporary period. Use of GIS and geographic analysis in business decisions. Trade zone, geographic market-area analysis, and gravity retail models.
MET 5504: Weather and Forecasting (3) *Prereq: familiarity with basic meteorology.* Skill development in predicting and discussing daily weather patterns using meteorological instruments to collect data and analyze weather events.
MET 6530: Hurricanes (3) *Prereq: familiarity with basic meteorology.* Meteorological and climatological concepts related to hurricanes. Forecasting current activity; researching past storms;

and analyzing storm structure, damage, and future trends.
MET 6752: Atmospheric Data Analysis (3) *Prereq: MET5504 or MET6530, or consent of instructor.* How atmospheric data is collected and analyzed both for meteorologic and climatologic-scale research. Learn where to obtain various types of data and how to analyze data to answer specific research questions.

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Geological Sciences

College of Liberal Arts and Sciences

Graduate Faculty

Chair: P. A. Mueller. *Graduate Coordinator:* J. M. Jaeger. *Complete faculty listing by department*: Follow this link

The Department of Geological Sciences offers programs leading to the Master of Science (thesis), the Master of Science in Teaching (nonthesis), and the Doctor of Philosophy degrees in geology. Requirements for these degrees are described in the *General Information* section of this catalog.

The Department has identified six primary areas of emphasis in its research and teaching programs: environmental geology and hydrology, paleoclimatology, tectonophysics, geochemistry and mineralogy/petrology, marine and coastal geology, and paleomagnetism. For more detailed information on current departmental activities, faculty, and research centers, see http://web.geology.ufl.edu. The Department has collaborative, interdisciplinary programs of study and research with the Florida Museum of Natural History, the Center for Wetlands Research, the Land Use and Environmental Change Institute (L.U.E.C.I.), and the hydrological sciences cluster.

For admission to graduate status in the Department of Geological Sciences, a student must have a baccalaureate degree with a major in geology or a related field or its equivalent. Deficiencies in undergraduate preparation can be corrected by completing the undergraduate courses without credit while enrolled as a graduate student.

Applicants should take the GRE general test. The scores of this examination must be reported to the Department of Geological Sciences. Three letters of recommendation are also required for admission to the doctoral program and for financial aid applications at any level.

A minimum of 33 semester hours of graduate level courses are required for the Master of Science in geology. At least 24 hours must be in organized graduate-level geology courses (excluding research, teaching, special projects, etc.). Six hours of thesis research credit are required. All master's degrees are terminal; a separate and new application for admission to the doctoral program is required.

For the Master of Science in Teaching degree, at least 36 hours are required. Six of these hours must be in GLY 6943 and at least 24 must be in organized graduate-level geology courses. The remaining 6 hours must be in approved electives. A minor in education is required. Candidates also must pass the final oral examination.

Of the 90 semester hours required for the Ph.D., 45 must be in formal, organized graduate-level class work (excluding individual work, supervised research and teaching, advanced research, dissertation, special projects, etc.). Remaining credits will be in GLY 7979, GLY 7980, additional geology courses, or courses in a related field.

The Department offers a combined bachelor's/master's degree program. Contact the graduate coordinator for information.

BOT 5115: Paleobotany (3) *Prereq: upper-level course in botany or geology; or consent of instructor.* Comparative study of plants through geologic time with attention to morphology and evolution of major groups of land plants, based on the fossil record. Offered spring term in odd-numbered years.
GLY 5156: Geologic Evolution of North America (3) *Prereq: GLY 2010 or 2026; 4400C recommended.* Key geological features of North American plate and important aspects of their geological evolution through time. Current and past plate tectonic setting, major geological and geomorphologic provinces, geophysical aspects of North American lithosphere, and natural resources.
GLY 5241C: Geochemistry (3) *Prereq: CHM 2046, GLY 2010C.* The abundance and distribution of the elements and their behavior during various geological processes.
GLY 5245: Hydrogeochemistry (3) *Prereq: inorganic chemistry, calculus, or consent of instructor.* Geological controls on chemical and isotopic composition of natural waters, including meteoric ground water, brines, and sea water; emphasizing thermodynamic and kinetic aspects of fluid-solid reactions.

GLY 5247: Surface and Ground Water Interactions(3) *Prereq: geology/hyrdroecology and undergraduate chemistry and physics.* Classic and new literature that deals with interactions between surface and ground water. Emphasizes submarine ground water discharge in estuary and coastal zones, hyporheic zones of streams, and karst aquifers.

GLY 5248: Physical Geochemistry(3) *Prereq: calculus I, introductory chemistry, or consent of instructor.* Principles, theory, practice, and application of thermodynamics and kinetics to geochemical processes.

GLY 5255: Organic Geochemistry and Geobiology(3) *Prereq: one year introductory chemistry, one year introductory geology.* Theory, practice, and methods of organic geochemistry, organic biogeochemistry, and geomicrobiology.

GLY 5328: Advanced Igneous Petrology(3) *Prereq: GLY 4310C or equivalent.* Compositional variability, phase relations, and petrogenetic history of igneous rocks, volcanic regions, and mantle. Theories of petrotectonic associations and magmagenesis.

GLY 5455: Introduction to Geophysics and Tectonics (3) *Prereq: GLY 2010C, 2026C, or 4400C and 1 year of college physics or consent of instructor.* Physics of the Earth. Study of gravity and magnetic fields, seismic waves, thermal history, orogenic belts, and plate tectonic theory.

GLY 5466: Seismology and Earth Structure (3) *Prereq: MAP 2302 or GLY 5455 or PHY 2048 or PHY 2060 or consent of instructor.* Introduces basic theory of elastic wave propagation in the Earth. Applies seismology as a tool for determining Earth structure and explains relationships between earthquakes and plate tectonics.

GLY 5468: Terrestrial Gravity and Magnetism (3) *Prereq: MAP 2302 or PHY 2060, and GLY 5455, or by consent of instructor.* Survey of potential field theory with applications to gravity and magnetism of the Earth.

GLY 5476: Environmental Geophysics (3) *Prereq: GLY 2010C or 2026C and 1 year of college physics or consent of instructor.* Reflection and refraction seismology. Gravitational, magnetic and electrical methods of exploration. Instrumentation, surveying techniques, and data reduction and interpretation.

GLY 5558C: Sedimentology (3) *Prereq: GLY 2010 or 2026; 4552.* Lecture and discussion of major sedimentary processes active in coastal and continental margin settings, focus on relating processes with sedimentary facies. Class work augmented with frequent field trips.

GLY 5705: Geomorphology (3) *Prereq: GLY 4400C.* Application of principles of geomorphology to origin and evolution of landscapes.

GLY 5736: Marine Geology (3) *Prereq: GLY 2010C, or 2026C, or OCE 1001.* Detailed introduction to the origin and evolution of ocean basins, ocean margins, and oceanic sediments and microfossils, including a paleoceanographic history of the marine realm.

GLY 5786L: Topics in Field Geology (2; max: 6) *Prereq: graduate standing and consent of instructor.* Visits to selected sites

and regions of outstanding geologic value and interest.
GLY 5827: Ground Water Geology (3) *Prereq: GLY 2010C, or 2026C.* Principles of ground water geology, with special reference to the Coastal Plain and Florida.
GLY 6075: Global Climate Change: Past, Present, and Future (3) *Prereq: GLY 4552C.* Evolution of the Earth's climate through geologic time, including discussion of modern climatology and methods of paleoclimate interpretations.
GLY 6268C: Isotope Geology (4) *Prereq: GLY 5241C.* Application of radiogenic and stable isotopes to the solution of geologic problems such as geochronology, petrogenesis, and paleoclimatology.
GLY 6297: Topics in Geochemistry (3; max: 6) *Prereq: GLY 5241C.* Applications of geochemical (elemental and isotopic) methods and data to tectonics and petrology).
GLY 6425: Tectonics (3) *Prereq: GLY 4400C.* Evolution and formation of mid-ocean ridges, seamounts, hot spots, island arcs, back-arc basins, passive margins, and mountain chains.
GLY 6519: Stratigraphy and Timescales(3) *Prereq: consent of instructor, or undergraduate degree in geology.* Methods in stratigraphy including biostratigraphy, chemostratigraphy, manetostratigraphy, and cyclostratigraphy and how these tools are integrated to generate geologic timescales in absolute time.
GLY 6620C: Micropaleontology(3) Classification and identification of biostratigraphically important microfossil groups and their use in local and regional correlation.
GLY 6695: Topics in Paleoclimatology (4; max: 12) *Prereq: undergraduate degree in geology or consent of instructor.* Studies of paleoclimates and interpretation of climate change from rock record.
GLY 6826: Hydrogeologic Modeling(3) Application of computer modeling to hydrogeologic problems through use of analytical and numerical solutions.
GLY 6895: Nonmetallic Geologic Materials (3) *Prereq: GLY 3200C.* Geologic occurrences, properties, and uses of limestone, shales, and other nonmetallic deposits.
GLY 6905: Individual Work (1-4; max: 12) For work beyond that offered in regular courses.
GLY 6931: Seminar (1; max: 2) Reading in special topics.
GLY 6932: Special Topics in Geology (1-3; max: 9) Lectures, conferences, or laboratory sessions covering selected topics of current interest in modern geology.
GLY 6940: Supervised Teaching (1-5; max: 5) S/U.
GLY 6943: Internship in College Teaching (2-6; max: 6) Required for Master of Science in Teaching candidates, but available for students needing additional practice and direction in college-level teaching.
GLY 6971: Research for Master's Thesis (1-15) S/U.
GLY 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students

who have been admitted to candidacy. S/U.

GLY 7980: Research for Doctoral Dissertation (1-15) S/U.

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Germanic and Slavic Studies

College of Liberal Arts and Sciences

Graduate Faculty

Chair: J. S. Adler. *Graduate Coordinator:* B. C. Mennel. *Complete faculty listing by department*: Follow this link

The Department offers an M.A. (with or without thesis) and a Ph.D. in German. Requirements for these degrees are given in the *General Information* section of this catalog.

Prerequisite for admission to graduate work is an undergraduate major in the field, including advanced courses in both literature and language. Qualified candidates with B.A. degrees in related disciplines will be considered. Those students who wish to enter the Ph.D. program are expected to have an M.A. in German. M.A. degrees in related disciplines will be considered. A good foundation in a second language is desirable for M.A. candidates. Ph.D. candidates should consult the Graduate Coordinator for details on the foreign language requirement. Graduate students normally teach as a part of their training.

German Language

GER 6060: Beginning German for Graduate Students I (3) For graduate students from other departments who need to acquire a reading knowledge of German. Not open to graduate students in German. S/U.
GER 6061: Beginning German for Graduate Students II (3) *Prereq: GER 6060 or its equivalent.* For graduate students from other departments who need to acquire a reading knowledge of

German. Not open to graduate students in German. S/U option.
GER 6505: German Culture (3) Interdisciplinary study of periods and major aspects of German culture from the Middle Ages to the present.
GER 6940: Supervised Teaching (1-3; max: 3) *Prereq: departmental approval.* S/U.

German Literature and Cinema

GET 6295: Weimar Cinema (3) Weimar cinema, and theory and criticism that surround it. Examination of intersection between formal-aesthetic and ideological-political aspects as manifest in film text.
GET 6299: New German Cinema and Its Legacy(3) "New German cinema" as response to Hollywood cinema, Germany's Nazi past and problems posed to society, and cinema by other mass media and new imaging technologies. Analytical texts draw from new historicism, cultural studies, psychoanalysis, and postmodernism.
GEW 6205: Foundations of Literary Study (3) *Required for M.A. and Ph.D. candidates in German.* Focus on literary criticism and methodology. Different theoretical approaches to literature and research techniques. Recent developments.
GEW 6266: History of the German Novel (3) Development of novel from its beginning in 17th century to its rise in late 18th, 19th, and 20th centuries as well as history of theories about novels.
GEW 6305: Studies in German Drama and Theater (3) Main trends in the development of German drama during different literary periods. Analysis of individual plays and theoretical texts.
GEW 6405: Medieval and Renaissance Literature (3) Courtly and heroic epic, VolksbÃ¼cher, and major genres and trends from the Medieval and Renaissance period.
GEW 6425: From Luther to Lessing: Early Modern German Literature (3) Analysis of major trends, authors, and texts from Reformation to Enlightenment.
GEW 6535: German Classical and Romantic Literature (3) Analysis of major authors and texts. Special attention to developments in culture, aesthetics, and society.
GEW 6558: Young Germany, Biedermeier, Realism, and Naturalism (3) Writers of the 19th century including Moerike, Heine, Droste-Huelshoff, Stifter, Keller, Raabe, Storm, Fontane, Meyer, Hauptmann.
GEW 6725: Culture and Society in the Weimar Republic (3) Intellectual and cultural life between 1918 and 1933. Analysis of literary works from theater, cabaret, and cinema within context of social and political life of the Weimar Republic.
GEW 6726: Literature and Culture in the Third Reich (3) Analysis of major literary and nonliterary works of Nazi period. Appropriation of German literary tradition. Examination of Nazi theater and film. Literature of the so-called inner emigration.
GEW 6735: Modern German Literature (3) Literary trends and

major works of early twentieth century. Authors may include Mann, Rilke, Kafka, and Hesse. Relation to contemporary cultural and aesthetic developments.

GEW 6736: Contemporary German Literature (3) Literary trends from 1945 to present. Relation to contemporary cultural and aesthetic developments. Current developments.

GEW 6826: German Literary Theory (3) Major figures in field from nineteenth century to present. Emphasis on question of hermeneutics and different responses developed by literary theoreticians. Special focus on most recent developments in field.

GEW 6900: Seminar in Germanic Languages and Literatures (3; max: 9)

GEW 6901: Special Study in Germanic Languages and Literatures (3; max: 9) Intensive study of a selected topic.

GEW 6905: Independent Study (3; max: 9) *Available by special arrangement.* May be taken only once for M.A. credit.

GEW 6910: Supervised Research (1-5; max: 5) S/U.

GEW 6971: Research for Master's Thesis (1-9) S/U.

GEW 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

GEW 7980: Research for Doctoral Dissertation (1-15) *For students admitted to candidacy.* S/U.

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Gerontological Studies

College of Liberal Arts and Sciences

Director and Graduate Coordinator: P.A. Kricos. *Complete faculty listing by department*: Follow this link

The Center for Gerontological Studies offers the Graduate Certificate in Gerontology for master's, specialist, and doctoral students, which is completed in conjunction with their graduate degree programs. A partial listing of programs, departments, or colleges includes Nursing, Psychology, Clinical and Health Psychology, Occupational Therapy, Physical Therapy, Rehabilitation Counseling, Sociology, Exercise and Sport Sciences, Communication Sciences and Disorders, Audiology, and Recreation, Parks, and Tourism. Students may also minor in gerontology at the master's or doctoral level. The Center affords students in many disciplines the opportunity to concentrate in gerontology through training that incorporates multidisciplinary instruction, field experience, and research. More information is available at http://www.geron.ufl.edu. Questions may be e-mailed to info@geron.ufl.edu.

In addition to those listed below, courses with aging content are offered by affiliated faculty and listed in their primary departments. A list of approved courses for the certificate or minor may be found at http://www.geron.ufl.edu/appcours.htm.

GEY 5935: Topics in Gerontology (3; max: 12)
GEY 6206: Interpersonal Communication Within the Aging Network(3) *Prereq: GEY 6646.* Effective communication with clients, caregivers, and care teams. Dealing with conflict, therapeutic relationships, interviewing, report-writing,

intergenerational communication, and cultural considerations.
GEY 6220: Overview of Geriatric Care Management (3) *Prereq: GEY 6646.* Overview of geriatric care management in aging network.

GEY 6646: Issues and Concepts in Gerontology (3) A multidisciplinary, team-taught survey of the field.
GEY 6905: Independent Study in Gerontology (1-3; max: 4)
GEY 6936: Professional Development in Gerontology/Geriatrics(1-2; max: 10) Research proposals, professional ethics, teaching, theoretical issues, academic journals, research trends, methodologies, conference and colloquium presentations, and career planning.
GEY 7408: Psychotherapy with Older Adults(3) *Prereq: admission to graduate study in counseling psychology or clinical and health psychology or consent of instructor; PCO 7944 for counseling psychology or CLP 6407 for clinical and health psychology.* Psychotherapeutic interventions with older adults.

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Health Education and Behavior

College of Health and Human Performance

Graduate Faculty

Chair: R. M. Pigg, Jr.. *Graduate Coordinator:* V. J. Dodd.
Complete faculty listing by department: Follow this link

The Department of Health Education and Behavior offers a Ph.D. in health and human performance with a concentration in health behavior and a 36-credit M.S. degree in health education and behavior with thesis, project-in-lieu-of-thesis, and nonthesis options. The M.S. degree program also offers a specialization in community health education. Requirements for the Ph.D. and M.S. degrees are given in the General Information section of this catalog.

The Ph.D. degree program trains health behavior researchers for academic positions in higher education, for leadership positions in federal health agencies (such as the Centers for Disease Control and Prevention, and the National Institutes for Health), and for postdoctoral research fellowships. The 36-credit M.S. degree allows students to design individualized programs of study suited to their professional interests and career goals. Students can complete their degree program in one calendar year. The Department also offers an accelerated B.S./M.S. program in health education and behavior to enable students to receive both B.S. and M.S. degrees with a reduction of 12 credits (about one semester of course work). Applicants to the Ph.D. and M.S. programs often hold a previous degree in health education or a degree from a social or behavioral discipline, but applications from other disciplines are also considered.

The M.S. program is for students seeking an advanced practitioner's degree. Students acquire the knowledge and skills to plan and evaluate health education interventions for individuals, families, and groups of all ages. Health education specialists perform activities such as

--Advocating for health promotion programs in schools, communities, health care facilities, and worksites

--Conducting needs assessments to identify health priorities

--Planning, implementing, and evaluating health promotion interventions

--Developing health information materials

--Seeking financial support to fund health education interventions

--Serving as a resource person for health information and referrals

--Using a variety of instructional strategies appropriate to the setting

--Conducting research and evaluation on the effectiveness of programs and strategies

--Writing scholarly and professional articles

--Working collaboratively with public and private organizations and agencies to achieve the goal of a healthier population.

This degree prepares the health education specialist to work in

--Local, state, and federal health agencies
--Nonprofit health organizations
--Schools and universities
--Patient care settings
--Private industry
--A variety of public service occupations.

Sample position titles for individuals with this degree include

--Health education specialist or health informatics specialist
--Public health adviser or public health analyst
--Community health education specialist
--Health education coordinator or health education consultant
--Health promotion coordinator
--Campus health educator or patient health educator,
--Health communication specialist
--HIV/AIDS educator
--Nutrition educator.

This degree may also give students a competitive edge when applying to professional school such as law, medicine, physician assistant, dentistry, chiropractic, osteopathy, nursing, occupational therapy, and physical therapy.

For additional information, visit http://www.hhp.ufl.edu/heb.

HLP 7979: Advanced Research in Health and Human Performance (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field, or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
HLP 7980: Research for Doctoral Dissertation (1-15) S/U.
HSC 5135: Emotional Health Education (3) Importance of emotional health in achieving optimal health. Health educator's role in program development, supportive listening, and referral strategies for counseling. Development of communication skills. Common emotional health problems and concerns. Not open to students who have completed HSC 3134.
HSC 5138: Human Sexuality (3) Theory and practice, including psychosexual development, human reproduction, sexual relationships, dysfunction, therapy, legal and ethical issues, as well as teaching and facilitative techniques. Not open to students who have completed HSC 3133.
HSC 5142: Drug Education (3) Social, behavioral, environmental, and historical perspectives on substance abuse; content, issues, and instructional strategies appropriate for health education regarding alcohol, tobacco, and other drugs in school and community settings. Not open to students who have completed HSC 3140.
HSC 5315C: Teaching Health in Elementary Schools (3) Examines needed health education areas, lesson and unit planning, methods and innovative approaches to health instruction, and evaluating comprehensive school health education.
HSC 5536C: Medical Terminology for the Health Professions (3) "Literal" and "actual" meanings of medical and scientific terms. Anatomy, physiology, diagnostic, clinical, therapeutic, and pathology pictures presented with compound medical terms. Writings and pronunciation exercises augment the visual format to provide an interactive working knowledge of medical language.
HSC 5576: Nutrition Education for Special Populations (3) Assessing nutrition information needs for selected population groups. Planning, implementing, and evaluating nutrition education programs for school and community settings. Not open to students who have completed HSC 3574.
HSC 5606: Spirituality and Health (3) Exploring current research and theory about the relationship of spirituality and health/disease.
HSC 5618: Advanced Exercise Therapy, Adapted Physical Activity, & Health (3) Art and science of effectively teaching exercise therapy, adapted physical activities, and healthy living

strategies. Medical and health characteristics of common disabilities and methods for prescribing appropriate exercise therapy programs are presented. Multiple adapted equipment ideas will be presented to facilitate teaching in inclusive settings for all ages. Clinical experiences with individuals with disabilities are provided.

HSC 5626: Minority Health Issues (3) Current health problems confronting socioeconomically disadvantaged groups and ethnic minority groups.

HSC 5657: Health and End-of-Life Issues (3) Cultural, spiritual, and psychological traditions that affect health decisions, behavior, and medical care. Emphasizes developing professional and personal skills for coping with end-of-life issues for oneself and for assisting others.

HSC 5925: Seminar in Health Education (1-6; max: 6)

HSC 5956: Writing for Professional Publications (3) Procedures and practices in scholarly writing for health-related professional publications including topic selection, literature searches, internet applications, documentation, manuscript preparation, reasons for rejection, and legal and ethical considerations.

HSC 5XXX: Advanced Exercise Therapy, Adapted Physical Activity, and Health(3) *Prereq: consent of instructor/adviser.* The art and science of effectively teaching exercise therapy and adapted physical education. Understanding specific medical health characteristics of common disabilities to determine the best educational implications for an exercise setting.

HSC 6037: Philosophy and Principles of Health Education (3) History, philosophy, and ethics; theories of health behavior and principles of learning; areas of professional specialization; roles and functions of professional health educators; certification and continuing education; trends.

HSC 6216: Environmental Health (3) Human interactions and the environment. How the environment, broadly defined, affects human health. Exploring personal and local solutions to current environmental concerns.

HSC 6235: Patient Health Education (3) Health education theory and principles applied to the primary health care setting. Overview of agents and processes of disease, emphasizing program development for teaching protocols for specific diseases. Recent developments in patient education (e.g., outpatient programs and wellness centers).

HSC 6318: Planning Health Education Programs (3) Basic principles of health education for various community settings, and using communication media in joint planning for comprehensive health education.

HSC 6507: Epidemiology (3) Procedures used in studying the origin, distribution, and control of chronic and communicable diseases. Emphasizes the role of health education interventions in disease control.

HSC 6567: Health Promotion and Programming in Gerontology (3) Planning, implementing, and evaluating health maintenance and promotion programs for adult populations, emphasizing the aging

process.

HSC 6571: Contemporary Issues in Health Promotion (3) Emotional health, value systems, stress and depression, aging and death, drug abuse, physical fitness, weight control, consumer health, and chronic and communicable diseases.

HSC 6575: Women's Health Issues (3) Relevance for health promotion, prevention, education, and counseling.

HSC 6595: HIV/AIDS Education (3) Examine the medical, social, legal and educational implications of HIV/AIDS on individuals and society.

HSC 6604: Theories of Health Behavior and Practice in Health Education (3) Selected health behavior theories and applying these theories to the practice of health education and health promotion.

HSC 6605: Scientific Foundations of Holistic Health (3) Examining and interpreting the holistic principles that influence and modify the health potential of the individual and the community.

HSC 6625: Trends in International Health (3) Disease patterns and prevalence, contributing factors, organizational and governmental initiatives, and model programs; emphasizes problems amenable to health education interventions. Not open to students who have completed HSC 4650.

HSC 6629: Health Promotion for Priority Populations(3) *Prereq: graduate standing.* Health issues confronting politically and socioeconomically disadvantage groups and ethnic minority groups.

HSC 6637: Social Marketing and Health(3) Current theory and knowledge in field of social marketing. Analysis of components and applications of marketing within context of health behavior.

HSC 6646: Community Health Methods in Injury Prevention & Control (3) *Prereq: HSC 3032* Research-based concepts and theories related to unintentional injury prevention and control. Epidemiology and mechanisms of injury, community health injury surveillance systems, incidence and prevalence rates by category of injury, and role of law in injury prevention. Methods for planning, implementing, and evaluating injury prevention programs. Trends and future directions for research.

HSC 6665: Health Communication (3) Survey of theory and research relevant to the role of communication processes in health behavior, health care, and health promotion.

HSC 6667: Health Communication Programs (3) *Prereq: HSC 6665 or consent of instructor.* Theory, research, and skills for planning, implementing, and evaluating health communication programs.

HSC 6668: Interpersonal Communication and Health (3) Theory, research, and application of the role of interpersonal communication in health behavior, health care, and health promotion.

HSC 6695: Worksite Health Promotion (3) Procedures involved in planning, implementing, and evaluating comprehensive health promotion programs; factors in risk assessment and reduction; strategies and resources for employee health education; ethical issues in client relations. Not open to students who have completed

HSC 4694.

HSC 6712: Evaluating Health Education Programs(3) Models and strategies for conducting formative and summative evaluations of health education programs.

HSC 6735: Research Methods in Health Education(3) Introduction to methods of health education research.

HSC 6850: Internship in Health Education (1-12; max: 12)

HSC 6904: Readings in Health Education (1-3; max: 6)

HSC 6905: Independent Study (1-3; max: 12)

HSC 6910: Supervised Research (1-5; max: 5) S/U.

HSC 6935: Current Topics in Health Education (1-3; max: 6)

HSC 6940: Supervised Teaching (1-5; max: 5) S/U.

HSC 6971: Research for Master's Thesis (1-15) S/U.

HSC 6973: Project in Lieu of Thesis (1-9) Planning, implementing, and evaluating a health education program intervention. S/U.

HSC 7904: Advanced Readings in Health Education (1-3; max: 6)

HSC 7905: Advanced Independent Study in Health Education (1-3; max: 6)

HSC 7937: Advanced Seminar in Health Education(3)

PET 5127: Advanced Instructors of Adapted Aquatics (3) *Prereq: consent of instructor/adviser.* The art and science of effectively teaching aquatics to special populations. Aquatics teaching methods for individuals with physical, mental/emotional, sensory, medical, and health disabilities.

PET 5655C: Medical Aspects of Individuals with Disabilities (3) Teaching exercise therapy and adapted physical education to individuals of all ages with physical, mental, and health disabilities.

PET 5936: Special Topics/Seminars (1-3)

PHC 6105: Organization and Administration of Public Health Programs (3) Structure and function of local, state, and federal programs including official agencies, voluntary agencies, and health-related private-sector activities related to current emphases on health promotion and chronic disease control.

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Health Services Research, Management, and Policy

College of Public Health and Health Professions

Graduate Faculty

Chair and Graduate Coordinator: R. P. Duncan.
Complete faculty listing by department: Follow this link

The Department of Health Services Research, Management, and Policy offers degree programs at both the master's and doctoral level. The Master of Health Administration prepares individuals for management positions in the health care field. The Department also participates in the Master of Public Health degree by offering a concentration in public health management and policy. These programs are described more fully in the *General Information* section of this catalog under the heading *Specialized Graduate Degrees.*

At the doctoral level, the Department offers the Ph.D. degree in health services research. This full-time program prepares graduates to investigate and evaluate the complexities of health care systems in the U.S. and elsewhere. Health services research is a multidisciplinary field that examines the delivery, organization, financing, and outcomes of health care services.

HSA 5103: Introduction to the U.S. Health Care System (3) *Prereq: consent of instructor.* Overview of organization, delivery, and financing. Historical antecedents, patients, providers, payers, and health policy.
HSA 5174: Fundamentals of Health Care Finance (3) *Prereq: consent of instructor.* Introduction to basic theory and principles of finance as applied to the health care industry. Financial statements,

cost measurement, budgeting, and capital investment decisions.

HSA 6105: Professional Skills Seminar (1) *Prereq: consent of instructor.* Presentations by speakers from health-related organizations and programs designed to improve career planning and professional skills. S/U.

HSA 6114: U.S. Health Care System (3) *Prereq: consent of instructor.* Overview of structural elements of the contemporary system. Historical antecedents, patients, providers, payers, and the role of health policy.

HSA 6119: Introduction to Management of Health Services Organizations (3) *Prereq: consent of instructor.* Organizational principles and practices as applied to management. Organizational theory, managerial role, managing groups, work design, and organization design.

HSA 6126: U.S. Health Insurance System (3) *Prereq: consent of instructor.* Description and analysis of U.S. health insurance systems. Topics include private vs. public insurers, demands for health insurance, health plan types, premium setting, and reimbursement of providers.

HSA 6152: Overview of U.S. Health Policy (3) *Prereq: consent of instructor.* Survey and critical analysis of federal and state health policy processes and outcomes as they relate to the effectiveness and efficiency of health services in the U.S. and selected countries.

HSA 6175: Health Care Financial Management (3) *Prereq: EMHA option.* Applying corporate finance concepts and principles to health care organizations with the goal of improving financial decision making.

HSA 6178: Advanced Health Care Finance (2) *Prereq: consent of instructor.* Applying accounting and financial management theory and principles to the health care industry, emphasizing managed care organizations and integrated delivery systems.

HSA 6179: Introduction to Health Care Finance (3) *Prereq: consent of instructor.* Applying accounting and financial management theory and principles to the health care industry, emphasizing provider organizations.

HSA 6188: Strategic Management in Health Administration (3) *Prereq: consent of instructor.* The relationship of a health care organization to its environment. Strategic management processes, business planning, and other perspectives to aid in managing complex health care organizations.

HSA 6196: Health Services Operations Management (3) *Prereq: consent of instructor.* Quantitative methods to support effective decision making. Descriptive statistics, sampling, quality control, hypothesis testing, regression analysis, forecasting, inventory control, and queuing models.

HSA 6197: Information Management in Health Administration (3) Survey of information systems in healthcare administration (system composition, role, and development). Designing, evaluating, and selecting computer resources. Managing information technology in health care organizations. Current trends and issues in health care information systems.

HSA 6198: Information Management in Health Administration (3) *Prereq: consent of instructor.* Survey of management information systems. Analyzing system requirements, system design and evaluation, selecting computer resources, and managing the implementation process.

HSA 6342: Human Resource Management for Health Services Managers (3) *Prereq: consent of instructor.* Knowledge and skills needed for effective management in complex health services organizations. Focuses on human resource acquisition, retention, and exit, as well as labor relations issues.

HSA 6385: Performance Management for Health Care Managers (3) *Prereq: consent of instructor.* Overview, emphasizing implementation. Aspects of performance defined in relation to structure, process, and outcomes, and meeting expectations and requirements of patients, insurers, government, and other organizations.

HSA 6427: Legal and Ethical Issues in Health Administration (3) *Prereq: consent of instructor.* Survey of legal and ethical issues relating to health administration. Topics include government regulation, tort liability and malpractice, the professional-patient relationship, right to die, and patients without decisional capacity.

HSA 6436: Health Economics (3) *Prereq: consent of instructor.* Fundamental economic relations governing production, consumption, reimbursement, and financing of health services. Characteristics of markets for acute and long-term care services, insurance, and health care labor. Economic evaluation of technology.

HSA 6855: Internship in Health Administration (6) Supervised fieldwork in a health administration setting. S/U.

HSA 6858: Internship in Health Services Research (1-6; max: 6) *Prereq: consent of instructor.* Supervised fieldwork. S/U.

HSA 6878: Externship in Legal Aspects of Health Services Administration (3; max: 6) Supervised fieldwork in a health administration or health legal setting. S/U.

HSA 6905: Individual Study in Health Administration (1-3; max: 6)

HSA 6911: Research Seminar in Health Services Research (1; max: 6) Research presentations by graduate students. S/U.

HSA 6930: Special Topics in Health Services Administration (1-3; max: 6) Selected topics in theory and research in health services administration.

HSA 6935: Seminar in Health Administration (2; max: 4) *Prereq: consent of instructor.* Current issues including new organizational forms for health services delivery and financing, and changing governmental programs related to health care.

HSA 6939: Capstone Seminar in Health Administration (3) *Prereq: consent of instructor.* Analysis of cases dealing with administrative and policy issues in health services. Emphasizes problem-solving in ill-defined, multi-faceted situations.

HSA 6946: Internship in Public Health Management and Policy (1-6; max: 6) Supervised fieldwork. S/U.

HSA 7106: Seminar in Health Care Access and Utilization (3)

Prereq: consent of instructor. Overview of context and processes in which individuals seek and obtain health care services; distributional issues; equity.

HSA 7116: Health Services Organizational Research (3) *Prereq: consent of instructor.* Major perspectives in organization theory and their applications to the health care sector.

HSA 7157: Research Foundations of Health Policy (3) *Prereq: consent of instructor.* In-depth examination of U.S. health policy issues concerning cost, quality, and access; and interdisciplinary research methods used to address such issues.

HSA 7325: Seminar in Health Care Costs and Financing (3) *Prereq: consent of instructor.* Examination of health services research related to costs and financing. Cost measurement and analysis, health insurance, sources and methods of payment, current policy.

HSA 7414: Society, Health, and Medical Care (3) *Prereq: consent of instructor.* Overview of health and medical care as sociocultural phenomena; health behaviors, health care organizations, and health services delivery in a social and historical context.

HSA 7437: Advanced Health Economics (3) *Prereq: consent of instructor.* Exposure to advanced economics models of the health care sector, including static and dynamic models of consumer and producer behavior, risk selection in insurance markets, and optimal reimbursement mechanisms.

HSA 7707: Health Services Research Methods I (3) *Prereq: consent of instructor.* Current and historical thinking about the philosophy of science and scientific modeling. Experimental and quasi-experimental design. Introduction to measurement and sampling.

HSA 7708: Health Services Research Methods II (3) *Prereq: consent of instructor.* Review and appraisal of methods. Findings and examples from historical and contemporary studies. Introduction to qualitative and quantitative research methodologies.

HSA 7759: Quality and Outcomes in Health Services Research (3) *Prereq: consent of instructor.* Current research concerning small area variation, outcomes, appropriateness, and effectiveness. Theory and specifics of alternative quality improvement and assurance approaches. History of approaches to health care quality assessment.

HSA 7905: Advanced Individual Study in Health Services Research (1-3; max: 6)

HSA 7938: Advanced Seminar in Health Services Research (3; max: 12) *Prereq: completion of graduate core program and preliminary dissertation topic.*

HSA 7979: Advanced Research (1-4) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

HSA 7980: Research for Doctoral Dissertation (1-15) S/U.

PHC 6313: Environmental Health Concepts in Public Health (2 to 3) Survey of major topics in environmental health. Sources, routes, media, and health outcomes associated with toxic agents in the environment. Effects of agents on disease, water and air quality, food safety, and land resources. Current legal framework, policies, and practices.

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History

College of Liberal Arts and Sciences

Graduate Faculty

Chair: I.L. Altman. *Graduate Coordinator:* N. Caputo. *Complete faculty listing by department*: Follow this link

The Department of History offers the following graduate degrees: Master of Arts with fields of specialization in African, Asian, European, Latin American, and United States history, and the history of science and the Doctor of Philosophy with fields of specialization in African, European, Latin American, and United States history and the history of science.

In addition to materials required by the Graduate School for admission, applicants must send directly to the History Department the following evidence of aptitude and interest: Three recommendations, from persons competent to evaluate your potential for graduate work; A 3- to 5-page essay identifying your career goals and particular areas of interest; sample of your written work in history.

Interested students should consult the department web page for more information.

Master of Arts: This degree serves to prepare students for admission to a Ph.D. program, for a teaching career in high school or community colleges, or for a career in government or business.

Fields of specialization:

--African (East Africa, Southern Africa, West Africa)

--European (medieval, early modern, or modern)

--Latin American (colonial Latin America, post-Colonial Latin America, Brazil, and the Caribbean or Spanish America)

--United States history (early America, 19th century, 20th century)

--History of science (pre-Newtonian, modern physical, or modern biological science).

Thesis option requirements:

--A minimum of 30 credit hours

--At least 12 graduate-level regular course credit hours in your major field. In European, you must take a readings seminar in your area of specialization and one or more research seminars. In U.S. history, you must take the 19th-century America readings seminar, either the 20th-century or early America readings seminar, and at least one research seminar. In Latin American and African history and the history of science, you must take the relevant readings seminars in your area of specialization, one other readings seminar, and at least one research seminar.

--At least 6 graduate-level regular course credit hours outside the major field (but in the Department of History). We recommend that you invest these regular course hours in readings seminars.

--Take 3 hours of historiography (HIS 6061) by the fourth semester of graduate study.

--Take 3 regular course credit hours from outside the Department. These should be graduate-level hours, but undergraduate-level hours may be taken subject to approval by your adviser.

--Complete a master's thesis. The semester you graduate, you must be registered for a minimum of 3 thesis research hours (HIS 6971) in the fall or spring terms and 2 in a summer term. Your thesis should demonstrate your ability to handle the primary-source material of your field, and a working knowledge of the secondary literature; and should demonstrate your ability to present research results in a coherent, well-written study. The student must complete the thesis and make it available to readers 2 weeks before the oral examination, complete the application for the degree at the Office of the University Registrar before the deadline, and take the examination.

--Each student must pass a final comprehensive oral examination at the end of the program.

Non-thesis option requirements:

--A minimum of 30 credit hours.

--At least 12 graduate-level regular course credit hours inside your major field. In European, you must take a readings seminar in your area of specialization and one or more research seminars. In U.S. history, you must take the 19th-century American readings seminar, either the 20th-century or the early America readings seminar, and at least one research seminar. In Latin American or African history or the history of science, you must take the relevant readings seminars in your area of specialization, one other readings seminar, and at least one research seminar.

--At least 6 graduate-level regular course credit hours outside your major field (but in the Department of History). We recommend that you invest these regular course hours in readings seminars.

--Take 3 hours of historiography (HIS 6061) by your fourth semester of graduate study.

--Take 3 regular course credit hours from outside the Department; these should be graduate-level hours, but undergraduate-level hours may be taken subject to approval by your adviser.

--Complete a research seminar and/or a nonthesis project in history. Your primary goal in either is to complete an article-length essay (approximately 35 to 40 pages) of publishable or near-publishable quality. The essay should be based largely on primary sources.

--You must pass a final comprehensive oral and written examination conducted by your supervisory committee.

Supervisory committee for the M.A.: The committee normally consists of the chair and two other members of the graduate faculty. Additional members may be added if desirable. The committee assists in planning and supervising the student's program and conducts the final examination. The chair is also the thesis director if that option is chosen.

Duration: The M.A. program can be completed in 3 semesters of full-time registration but may take longer. The Department believes that normally no more than 4 semesters of full-time registration should be spent on the degree. These semesters need not be consecutive. The Board of Education has established 60 credit hours as a maximum for the master's degree. Up to 6 credits of graduate-level courses taken at another school with a grade of B or better may be transferred into the master's program.

Bachelor's/master's program: The Department offers a

combined 4/1 degree program that enables outstanding undergraduates to obtain both the B.A. and M.A. degrees in history after successful completion of 152 credit hours. The program is designed for the students who wish to continue their education in history past the bachelor's level but do not intend to pursue a doctorate in history. Students in this program are not eligible for departmentally controlled financial aid. Since students in the bachelor's/master's program have a graduate classification, students receiving undergraduate scholarships or Pell grants should check with the funding provider to make sure that they will not lose eligibility.

Doctor of Philosophy requirements:

--Professional competence in your major field

--Knowledge of two minor fields, one of which must be drawn from the approved major fields of specialization for the doctorate (African, European, Latin American, U.S. history, or the history of science) or from approved minor fields (Atlantic history, gender, legal history), and the other being thematic in nature and including at least 6 hours outside the Department.

--Pass a set of written and oral qualifying examinations testing competence in major and additional fields and your knowledge of the nature of history and the historian's task.

--A dissertation for which credit is given in HIS 7980.

History/law joint degree program: The Department of History and the College of Law offer a program in legal history leading to either the M.A. or a Ph.D. degree in history and the J.D. in law. Because the faculties of history and law stress interdisciplinary training, students admitted to the joint degree program will be allowed to count a significant number of hours toward both degrees. Applicants must be accepted by both the Graduate School and the College of Law. Normally, students will complete the course and examination requirements of both degrees in 4 years. Students may begin their first year of work in either history or law, but they must complete the first year of law school within 1 year and they must do so within the first 2 years after admission to the joint degree program.

For further information write to the Legal History Coordinator, Department of History, University of Florida, Box 117320, Gainesville, FL 32611-7320.

AFH 5297: History of African Agriculture (3) Begins with the transition to agriculture and continues through an examination of African agriculture in the post-colonial period.
AFH 5348: History of West Africa (3) Ghana empire to the

contemporary period.

AFH 5458: Southern Africa (3) *Prereq: consent of instructor.* History of Africa south of the Zambezi River since 1800, especially the Republic of South Africa.

AFH 5934: Topics in African History (3; max: 9)

AFH 6259: Seminar in Modern Africa (3; max: 6) In-depth reading and discussion of aspects of modern African history. Seminar focuses on specific themes, such as ethnicity, colonialism, violence, warfare, gender, religion, and nationalism.

AFH 6805: Theories and Methods of African History (3) Theories and methods that underlie the study of African history and change as the field has evolved over the last four or more decades. Attention to changing frameworks for viewing the African past, with a focus on the historians' research methods and techniques.

AFH 6934: Africa (3)

AFH 6936: Readings in African History (3; max: 6)

AMH 5405: The South to 1860 (3) *Prereq: consent of instructor.* History of the South from the Civil War to present, emphasizing the South as an integral region and its relationship to the rest of the nation. Not open to students who have taken AMH 4403 or equivalent.

AMH 5905: Special Studies (3; max: 12 including HIS 6905)

AMH 5930: Topics in United States History (3; max: 15)

AMH 6198: Early American Society (3) Readings seminar focusing on a selected topic or topics in American history through the War of 1812.

AMH 6199: Nineteenth Century America (3) Readings seminar focusing on a topic or topics in nineteenth century American history.

AMH 6290: Modern America (3) Readings seminar focusing on topics in American history in the twentieth century.

AMH 6356: Research in U.S. History (3) Reading and research to produce a paper demonstrating your ability to do research in primary sources and connect original work with existing historical literature.

AMH 6406: Readings in Southern History, 1607-1865 (3) An analysis of the major scholarly works and interpretations dealing with the development of a bi-racial society in the American South.

AMH 6465: Seminar in U.S. Urban History (3) Historical development of American cities and ways in which the urbanization process has reshaped social life.

AMH 6506: Seminar in American Labor History (4)

AMH 6516: Seminar in American Foreign Relations and Expansion (3) American foreign policy since 1945, the United States response to Third World nationalism, the changing historiographical debate over the nature of U.S. diplomacy, and other selected topics.

AMH 6557: Seminar in Constitutional or Legal History of the United States (3; max: 9) Chronological and thematic analysis of the evolution of American law, legal institutions, and constitutionalism from their English origins to present.

AMH 6677: Civil Rights Movement (3) Origins and development

of the southern civil rights movement that peaked between roughly 1954 and 1972.

ASH 5388: Topics in East Asian History (3; max: 9)

EUH 5546: Topics in British History (3; max: 9)

EUH 5934: Topics in European History (3; max: 15)

EUH 6126: Readings in Medieval History (3) Major themes; readings combine classic studies that shaped the field with current work exploring issues like gender, textuality and historical memory, and popular religion.

EUH 6174: Conversion in the Middle Ages (3) Examines the religious experience of the middle ages through reading and discussion of concepts such as conversion, martyrdom, sainthood, gender, and power.

EUH 6175: Ethnicity in the Middle Ages (3) Ethnicity as a form of social and political mobilization in the middle ages. Focuses on issues such as migration, ethnogenesis, medieval law, language and ethnic identity, kingdoms, and ethnic communities.

EUH 6176: Villages and Peasants in the Middle Ages (3) In-depth examination of such key concepts as manorialism, corvee, manumission, and using written and archaeological sources.

EUH 6213: Europe, 1500-1763 (3)

EUH 6289: Readings, Modern Europe (3; max: 6) Major themes; readings combine classic studies that shaped the field with current works exploring a wide range of topics.

EUH 6469: Modern German History (3) Interpretations of and approaches to German history, and introduction to advanced research in the area.

EUH 6935: Readings, Early Modern Europe (3; max: 6) Major themes; readings combine classic studies that shaped the field with current works exploring a wide range of topics.

EUH 6937: Readings in Mediterranean History (3; max: 6)

HIS 5450: Slavery in the New World: Comparative Perspectives (3) Examines the evolution of slavery in the New World from its European and African antecedents through abolition and emancipation.

HIS 5484: Science and the Enlightenment (3) Theoretical developments in the physical and biological sciences between the late seventeenth and late eighteenth centuries, including the significance of social and cultural dimensions of natural science.

HIS 5485: Special Studies in the History of Science (3; max: 9)

HIS 5487: Physical Science since 1800 (3) Major developments in physical science from the beginning of nineteenth century to the post-World War II period. Institutional and social aspects of the organization of scientific research.

HIS 5500: Life Science since 1800 (3) Critical problems of concern to biologists. The role of mechanistic/materialistic vs. vitalistic and reductionistic vs. holistic approaches to the development of biology; and the relationship of biology to physical and social sciences.

HIS 6060: Historical Method (3) Introduction to the methods of

research used by professional historians.

HIS 6061: Introduction to Historiography (3) Introduction to the schools, theories, and philosophies of the discipline of history.

HIS 6416: Problems in Comparative Legal History (3) Seminar begins with the question of what comparative legal history is and considers a series of case studies to explore approaches to comparative legal history.

HIS 6445: Postcolonial Theories (3) Readings in history and theory of aftermaths of European imperialism. Emphasizes the passage from colonial to postcolonial regimes. Critiques of colonialism and nationalist decolonization emerging in nineteenth- and twentieth-century Americas, Asia, Africa, and Europe.

HIS 6469: Topics in Historiography of History of Science(3; max: 9) History of writing in the discipline of history of science from the Enlightenment to Post-modern. Variable topics: classical studies, history of ideas, social construction.

HIS 6478: Topics in the Scientific Revolution(3) Social, cultural, and intellectual roots of modern science from Copernicus to Newton. Variable topics: primary sources, historiography, humanism and science.

HIS 6480: Pre-Newtonian Sciences (3) Physical and life sciences; may cut across chronological, geographical, and disciplinary boundaries.

HIS 6486: Seminar: Modern Biological Science (3) *Prereq: HIS 5500 or consent of instructor.* Themes and issues in the history of modern biological thought. Persistent controversies in evolutionary theory such as the nature of selection, units of selection, evolutionary rates, and the relationship of macroevolution to microevolution.

HIS 6488: Readings in the History of Science (1-4; max: 12) Inquiry into the development of western scientific thought and institutions. Specific historical topics having intellectual coherence and substantial historiography.

HIS 6489: Seminar: Social and Cultural History of Science (3; max: 9) Inquiry into social and cultural contexts of western science. Literature, cultural values, religious beliefs, communication networks, and educational institutions in western civilization. The issue of gender in science.

HIS 6905: Individual Study (1-3; max: 12 including AMH 5905)

HIS 6910: Supervised Research (1-5; max: 5) S/U.

HIS 6940: Supervised Teaching (1-5; max: 5) S/U.

HIS 6943: Internship in College Teaching (2,4,6; max: 6)

HIS 6957: Nonthesis Project in History(1-3; max: 9) Nonthesis research. S/U.

HIS 6971: Research for Master's Thesis (1-15) S/U.

HIS 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

HIS 7980: Research for Doctoral Dissertation (1-15) S/U.
LAH 5438: Modern Mexico (3) *Prereq: consent of instructor.* Topics in Mexican history from independence in 1821 to the present. Emphasizes the Diaz dictatorship and the Mexican Revolution. Not open to students who have taken LAH 4433 or equivalent.
LAH 5475: Caribbean, Nineteenth and Twentieth Centuries (3) *Prereq: consent of instructor.* A social history of the modern caribbean. Slave emancipation and decolonization; race relations and black consciousness; labor, culture, and economic change. Not open to students who have taken LAH 4472.
LAH 5476: Caribbean History to 1800: Slavery, Colonization, and International Conflict (3) *Prereq: consent of instructor.* Social, economic, and political history of the West Indies and the Circumcaribbean region to around 1800. Emphasizes slave societies. Not open to students who have taken LAH 4471.
LAH 5527: Andean Nations (3) *Prereq: consent of instructor.* Anthropological and political history of the postcolonial Andean region, including the republics of Venezuela, Colombia, Ecuador, Peru, and Bolivia.
LAH 5607: History of Amazonia (3) Introduction to the history of the Amazon region. Places the region in the wider context of Latin American history and Atlantic history from the pre-colonial era to the 1980s.
LAH 5637: Brazil Since 1750 (3) *Prereq: consent of instructor.* History of Brazil from the Portuguese era of reform to the military regime of 1964-85.
LAH 5933: Topics in Caribbean History (3) Introduction to historiography of the Caribbean. Pre-Columbian times to the present.
LAH 5934: Topics in Latin American History (3; max: 16)
LAH 6934: Seminar in Colonial Spanish America (3; max: 6)
LAH 6936: Seminar in History of Brazil (3)
LAH 6938: Seminar in Modern Spanish America (3)

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Horticultural Sciences

College of Agricultural and Life Sciences

Graduate Faculty

Chairs: D. J. Cantliffe (Horticultural Sciences) and T. A. Nell (Environmental Horticulture).
Graduate Coordinators: S. A. Sargent (Horticultural Sciences) and C. L. Guy
(Environmental Horticulture). *Complete faculty listing by department*: Follow this link

The Horticultural Sciences (HOS) graduate program is administered jointly by the Environmental Horticulture (HSE) and Horticultural Sciences (HS) departments and offers graduate programs leading to the Master of Science (thesis or nonthesis options) and the Doctor of Philosophy degrees. Members of the program's Graduate Faculty include department resident faculty and faculty at University of Florida Research and Education Centers located throughout Florida.

For admission to the HOS graduate program, apply to either the HS or HSE departments, depending on your career/research interest.

Requirements:
A strong undergraduate or graduate background in horticultural, biological, agronomic, or other disciplines in the life sciences and undergraduate coursework in chemistry, physics, and mathematics. A prospective graduate student need not have majored in horticulture as an undergraduate or master's student; however, students with curriculum deficiencies are required to take prerequisite subjects during the first year of graduate study. Undergraduate courses taken to correct curriculum deficiencies do

not count for graduate program credit.

Specializations in the HS department focus on vegetable and fruit crops and include
--Plant breeding and genetics
--Crop production and nutrient management
--Postharvest biology
--Organic sustainable agriculture
--Weed science
--Physiology and Biochemistry
--Plant Molecular Biology
--Protected Agriculture

Numerous HS and HSE faculty participate in the interdisciplinary plant molecular and cellular biology program. Students interested in molecular biology/biotechnology may pursue molecular-oriented studies in any listed specialization. Students interested in full specialization in molecular and related disciplines should contact the Plant Molecular and Cellular Biology interdisciplinary program for specific requirements.

Specializations in the HSE department:
--Breeding and genetics
--Ecology
--Floriculture
--Foliage
--Plant anatomy and development
--Plant biotechnology
--Stress physiology
--Taxonomy
--Tissue culture
--Turfgrass
--Woody plants

Graduate School Degree Program Requirements Master of Science (thesis option):
Students must earn at least 30 credits as a graduate student at UF. No more than 9 of the 30 credits (earned with a grade of A, B+, or B) may be transferred from institutions approved for this purpose by the Dean of the Graduate School. A minimum of 12 credits is required in the Horticultural Sciences major; additionally, a maximum of 6 credits in HOS 6971- Master's Research - may be counted toward the total credits. Beginning Summer A 2009 UF assign minus grades. For more information on M.S. degree programs see: http://gradschool.ufl.edu/catalog/current-catalog/catalog-graduate-degrees-and-programs.html#ma. A minor may be chosen in an academic unit other than the major. If a minor is chosen, at least 6 credits of course work are required in the minor field. Two 6-credit minors may be taken with the major academic unit's permission. A 3.00 (truncated) GPA is required for minor credit. In addition, a representative from the department in

which the minor is being received must be on the supervisory committee.

Master of Science non-thesis option:
This option offers additional training beyond the bachelor's degree in a horticultural specialization. Essential elements of this program include a program of courses and a comprehensive written and/or final oral qualifying examination. There is no thesis requirement. A minimum of 30 credit hours of course work is required. Courses taken for program credit must be numbered 5000 or higher with at least 15 of these credits in the Horticultural Science major. With supervisory committee and college dean approval, 6 hours of 3000- or 4000-level undergraduate courses, taught outside the major department, may count toward the minimum requirements for the degree. (http://gradschool.ufl.edu/catalog/current-catalog/catalog-graduate-degrees-and-programs.html#ma) A minor may be chosen in an academic unit other than the major. If a minor is chosen, at least 6 credits of work are required in the minor field. Two 6-credit minors may be taken with the major academic unit's permission. A 3.00 (truncated) GPA is required for minor credit. In addition, a representative from the department in which the minor is being received must be on the supervisory committee.

Doctor of Philosophy:
The Doctor of Philosophy is a research degree and is granted on evidence of general proficiency, distinctive attainment in a special field, and ability to conduct independent investigation as demonstrated in a dissertation presenting original research with a high degree of literary skill. Consequently, doctoral programs are more flexible and varied than those leading to M.S. degree programs. The Ph.D. degree requires at least 90 credits beyond the bachelor's degree, although specific course requirements vary from field to field and from student to student. Up to 30 credits of master's degree may tranfered to a doctoral program. Any credits counted from an M.S. degree program must have been earned within the previous seven years (or by petition). The Graduate Council does not specify the courses required for the Ph.D. degree.

General requirements for the program include
--a clear objective for research
--approval of the student's entire supervisory committee
--an appropriate number of credits of doctoral research

(http://gradschool.ufl.edu/catalog/current-catalog/catalog-graduate-degrees-and-programs.html#doctoral)

Minor: With the supervisory committee's approval, the student may choose one or more minor fields. Minor work may be completed in any academic unit outside the major, if approved for M.S. or doctoral programs listed in this catalog. The collective grade for courses included in a minor must be â€œBâ€ (3.00) or higher. If

one minor is chosen, the supervisory committee member representing the minor suggests 12 to 24 credits of courses numbered 5000 or higher as preparation for a qualifying examination. Part of this credit may have been earned in the M.S. degree program. If two minors are chosen, each must include at least 8 credits. Competence in the minor area is demonstrated by written examination by the minor academic unit, or by the oral qualifying examination. Minor course work at the doctoral level may include courses in more than one academic unit, if the objective of the minor is clearly stated and the combination of courses is approved by the Graduate School (this approval is not required for a minor in one academic unit). Further requirements for the Master of Science and the Doctor of Philosophy degrees are listed under those headings in the General Information section of this catalog.

ALS 5036: Contemporary Issues in Science (2) Current issues in science as related to students pursuing scientific careers. Discussion topics focus on issues of graduate education, funding for science, job markets, scientific research ethics, publication, and job expectations. Offered spring term. S/U.

ALS 5934: Graduate Professional Development Seminar (2) Presentations and group discussion of topics essential to enhance awareness, personal satisfaction, and professional success of graduate students S/U.

BOT 6935: Special Topics (1-4; max: 9)

HOS 5085C: Principles of Postharvest Horticulture (3) *Prereq: BOT 3503 and BCH 3023 or equivalent.* Biological principles involved in harvesting, grading, packaging, transportation, and marketing horticultural crops, and their effects on quality maintenance. Offered even-numbered years in fall.

HOS 5115C: Horticultural Plant Morphology and Identification (3) *Prereq: for graduate students who have not taken ORH 3513C.* Principles and practices of horticultural plant identification using vegetative and floral morphology.

HOS 5242: Genetics & Breeding of Vegetable Crops (3) *Prereq: AGR 3303 or equivalent.* Traditional and molecular breeding methods for vegetable crops and the influence of scientific research, government policies, and consumer preferences on vegetable crop improvement.

HOS 5306: Molecular Biology of Plant Hormones (3) *Prereq: BCH 6415 and HOS 4304 or equivalent.* Biochemistry, molecular biology, and physiology of plant hormones that control plant growth and development. Offered even-numbered years in fall.

HOS 5325C: Citrus Fresh Fruit Technology (3) *Prereq: BOT 3503 or equivalent.* Fresh citrus fruit physiology, pathology, handling, engineering principles, quarantine measures and regulations. Offered even-numbered years in spring, at Lake Alfred CREC.

HOS 5330: Postharvest Technologies for Horticultural Crops (2) *Prereq: HOS 5085 suggested. Open to graduate students and to upper-division undergraduate students with consent of instructor.*

Intensive study of current technologies and procedures for harvesting and handling fresh fruit, vegetable, and ornamental crops grown in Florida. Requires field trip during spring break. Offered in spring.

HOS 5515C: Greenhouse and Nursery Operations (3) *Prereq: for graduate students needing introduction to the principles of planning, organizing, and managing production operations. Not open to students who have taken ORH 3254.* Principles involved in managing nurseries. Interaction among media components, irrigation, and nutrition. Weekend field trips may be required.

HOS 5516C: Advanced Production of Greenhouse and Nursery Crops (3) *Prereq: ORH 3254 or HOS 5515C.* Decisions in scheduling crops and developing cultural plans. Test for Pesticide Applicators License required. Practical aspects of managing nursery workers. Maintenance of crops outside assigned laboratory and one weekend field trip required.

HOS 5555: Tropical Fruit Production and Research in Florida (3) A comprehensive study at the Tropical Research and Education Center at Homestead and field locations in South Florida. (Students will be in residence for 4 weeks at the Center.) Offered even-numbered years in summer.

HOS 5565: Advances in Vegetable Production Technology (3) Survey of scientific knowledge related to production of vegetable crops. Offered odd-numbered years in spring.

HOS 5616: Agricultural Meteorology (2) Causes and effects on agriculture of droughts, floods, freezes, heat waves, monsoons, hurricanes, thunderstorms, El Nino, and other weather phenomena. Offered even-numbered years in fall.

HOS 5711: Phytochemicals in food & health(3) *Prereq: BCH 4024 or equivalent or consent of instructor.* This course examines phytochemicals in fruits and vegetables including their distribution, roles in human health promotion, biosynthesis and degradation, enzymes, genes and case studies of crop breeding and engineering.

HOS 6201: Breeding Perennial Cultivars (3) *Prereq: AGR 3303.* Methods of breeding perennial fruit and ornamental cultivars using mutations, cell and tissue culture, polyploidy, recurrent selection, and wide hybridization. Conservation and domestication of wild plants. Offered odd-numbered years in fall.

HOS 6311: Seed Physiology (3) *Prereq: BOT 3503.* Examines dormancy, germination, growth, and development of seeds and the life processes involved; methods of handling and processing. Offered even-numbered years in spring.

HOS 6331: Postharvest Biology(3) *Prereq: BOT 3503 and 5505C or equivalents.* Physiological, biochemical, and molecular aspects of senescence and ripening of harvested fruit, vegetative, and floral organs with attention to the storage and quality maintenance of harvested plant organs.

HOS 6345: Environmental Physiology (4) *Prereq: BOT 3503 or consent of instructor.* Physiology from molecular to whole-plant level. The basis for responses to environmental factors such as

light, temperature, water, atmosphere, and stress extremes. Offered even-numbered years in fall.

HOS 6412: Nutrition of Horticultural Crops (3) *Prereq: BOT 3503 and HOS 4304 or equivalent.* Physiological, biochemical and environmental factors influencing nutritional status of horticultural plants and the resulting effects on growth, yield, and quality. Offered odd-numbered years in spring.

HOS 6523: Research and Development in Turfgrass Science (3) Principles and practices of turfgrass improvement and management, including propagation, nutrition, physiology, soil management, and experimental methods applied to turf research.

HOS 6535: Woody Plant Physiology (2) *Prereq: BOT 3503 or equivalent.* Selected topics in fruit crop physiology, including dormancy/chilling; source-sink relations; light relations in plant canopy; water relations. Offered even-numbered years in fall.

HOS 6545: Advanced Citriculture I (3) *Prereq: FRC 3212 and 4223 or equivalent.* Regulation of citrus vegetative growth including climactic, physiological, and cultural factors. Offered odd-numbered years in the fall at Lake Alfred CREC.

HOS 6546: Advanced Citriculture II (3) *Prereq: FRC 3212 and 4223 or equivalent.* Factors regulating flowering, fruit development and alternate bearing of citrus. Offered even-numbered years in spring at Lake Alfred CREC.

HOS 6905: Problems in Horticultural Science (1-4; max: 8) Independent study.

HOS 6910: Supervised Research (1-5; max: 5) S/U.

HOS 6931: Horticultural Science Seminar (1; max: 3) Oral presentation of material in one of the following areas: literature review, related to student's research; research results; or published paper, of relevance to horticulture. Subject matter determined by instructor. Offered in spring. S/U.

HOS 6932: Special Topics (1-4; max: 8) Study of contemporary research in horticultural science.

HOS 6940: Supervised Teaching (1-5; max: 5) S/U.

HOS 6941: Practicum in Horticultural Science (2-4; max: 8) *Prereq: admission is limited to graduate students majoring in horticultural science.* Supervised and individual work in professional areas of horticulture.

HOS 6971: Research for Master's Thesis (1-15) S/U.

HOS 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

HOS 7980: Research for Doctoral Dissertation (1-15) S/U.

ORH 5026C: Advanced Annual and Perennial Gardening (3) *Prereq: for graduate students who have not taken ORH 4808C.* Identification, selection, use, and management of annuals, perennials, herbs, and ornamental grasses in the landscape.

ORH 5086: Advanced Golf and Sports Turf Management (2) *Prereq: for graduate students who have not taken ORH 4223.* Golf

course and sports turf management.

ORH 5282: Orchid Biology and Culture (3) *Prereq: for graduate students who have not taken ORH 4280; or consent of instructor.* Orchid plants and flowers, including nomenclature, breeding, seed culture, harvesting, and handling.

ORH 5322C: Palm Biology and Culture (3) *Prereq: for graduate students who have not taken ORH 4321C; or consent of instructor.* Biology, vegetative and reproductive morphology, identification, container, liner, and field production of palms.

ORH 5815C: Advanced Florida Native Landscaping (3) *Prereq: ORH 1520 or 3513.* Introduction to nomenclature, effective use, and design elements of plants native to Florida.

ORH 7941: Doctor of Plant Medicine: Internship in Environmental Horticulture (1-6; max: 10) Environmental horticulture internship in an industrial or academic setting. S/U.

PCB 5065: Advanced Genetics(4) *Prereq: AGR 3303 or PCB 3063 and BCH 4024 or 5045. For graduate students in any life science discipline.* Examines genetic principles including gene and gene function; recombination and linkage; molecular markers, multipoint linkage analysis, and positional cloning; and quantitative, population, developmental, and non-Medalian genetics. Offered in fall term.

PCB 6528: Plant Molecular Biology (3) *Prereq: BCH 6415 and PCB 5065 or equivalents.* Cellular and developmental biology of plants. Lecture format with frequent discussion of recent papers. Topics include signal transduction, organelles, protein trafficking, and developmental mechanisms. Offered in spring term.

PLS 5222C: Propagation of Horticultural Crops (3) *Prereq: for students who have not taken PLS 3221.* Theoretical and practical applications of macro- and micropropagation techniques for higher plants.

PLS 5241C: Advanced Plant Micropropagation (4) *Prereq: PLS 3221 or consent of instructor.* Practical application of plant tissue for clonal propagation of horticultural crops.

PLS 5405: Advanced Composting Technology (3) *Prereq: for graduate students who have not taken PLS 4404C; or consent of instructor.* Humification of organic matter under controlled conditions.

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Human Development and Organizational Studies in Education

College of Education

Acting Director: Algina, J. Graduate Coordinator:

Programs leading to the Master of Arts in Education (M.A.E.), Master of Education (M.Ed.), Education Specialist (Ed.S.), Doctor of Education (Ed.D.), and Doctor of Philosophy (Ph.D.) degrees are offered through this school with programs in Educational Leadership, Higher Education Administration, Marriage and Family Counseling, Mental Health Counseling, Research and Evaluation Methodology, School Counseling and Guidance, and Student Personnel in Higher Education.

Requirements for these degrees are given in the General Information section of this catalog.

EDA 5938: Special Topics (1-3; max: 6) Explores current topics of special interest.
EDA 6061: Educational Organization and Administration (3) Basic concepts and practices in local, state, and federal organizations and administration.
EDA 6107: Leading Change in Educational Organizations (3) Organizational dynamics, and leadership theory and practice, and their roles in promoting successful change.
EDA 6192: Educational Leadership: The Individual (3) The individual as a leader and the role of educational leaders in group development.
EDA 6193: Educational Leadership: Instruction (3) Examination and analysis of role in curriculum change and school improvement.

EDA 6195: Educational Policy Development (3) Contemporary research on political power in policy decision making and role of educational leaders in policy development.
EDA 6215: Communications in Educational Leadership (3) School/community relations and communication implications for educational leaders.
EDA 6222: Administration of School Personnel (3) Problems of the professional school staff and administration of staff personnel in public schools.
EDA 6225: Labor Relations in Public Education (3) Various aspects of employee, union, and management relationships in public education.
EDA 6232: Public School Law (3) The law as it affects public school operation in America. Religion; desegregation; compulsory attendance; torts; curriculum; student control and discipline; and teacher freedoms, employment, and dismissal.
EDA 6242: Public School Finance (3) State, local, and federal financing of education.
EDA 6271: Technology Leadership for Educational Administrators(3) Application of computer technology to leadership and management of educational enterprise.
EDA 6423: Data-Driven Decision Making in Educational Organizations (3) Analytical and leadership issues related to conducting data-driven decision making in a professional, legal, ethical, and methodologically sound manner.
EDA 6503: The Principalship (3) Organization and administration of the school; emphasis on competencies necessary for leadership and management of the school center, both elementary and secondary.
EDA 6905: Individual Work (1-6; max: 12 including EDG 6905) *Prereq: students must have approval of proposed project before registering.* For advanced students who wish to study individual problems under faculty guidance.
EDA 6931: Special Topics (1-5; max: 10)
EDA 6935: Problems in School Administration and Supervision (1-15; max: 15) In-service training through regularly scheduled on-campus work conferences open only to superintendents and supervisors; or a problems course, offered through extension or on campus, for superintendents, supervisors, principals, junior college administrators, and trainees for such positions. S/U.
EDA 6948: Supervised Practice in School Administration (1-15; max: 15) *Prereq: open only to advanced students.* Opportunity to perform administrative duties under supervision. S/U.
EDA 6971: Research for Master's Thesis (1-15) S/U.
EDA 7206: Organizational Leadership in Education (3) *Prereq: EDA 6192.* Developing concepts and refining skills associated with planning and organizing in educational institutions.
EDA 7945: Practicum in Supervision and Administration (1-15; max: 15) A seminar and an internship in administration and supervision. S/U.
EDA 7979: Advanced Research (1-12) Research for doctoral

students before admission to candidacy. Designed for students with a master's degree in the field of study or students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

EDA 7980: Research for Doctoral Dissertation (1-15) S/U.

EDA 7990: Research Design in Educational Administration (3) *Prereq: EDF 7486 or equivalent. Open only to advanced graduate students.* Conceptualizing problems in administration and determining appropriate research procedures.

EDG 6250: The School Curriculum (3) *Required in all graduate programs in curriculum and instruction.* Theoretical and research bases underlying the development of the total school program from kindergarten through community college. Basic curriculum course for graduate students.

EDG 6285: Evaluation in the School Program (3) Procedures and techniques of evaluation in school programs. Emphasizes needs assessment, school self-study, and course evaluation.

EDG 6356: Teaching, Learning and Assessment (3) Historical and in-depth exploration of assessment practices related to curricular issues.

EDG 6905: Individual Work (1-6; max: 12 including EDA 6905) *Prereq: student must have approval of proposed project before registering.* For advanced students who wish to study individual problems under faculty guidance.

EDG 6910: Supervised Research (1-5; max: 5) S/U.

EDG 6931: Special Topics (1-4; max: 12 including EDA 6905) *Prereq: consent of instructor.*

EDG 6940: Supervised Teaching (2; max: 10) *Prereq: adviser's consent.* For graduate students serving as teaching assistants under the supervision of a faculty member. S/U.

EDG 6971: Research for Master's Thesis (1-15) S/U.

EDG 6973: Project in Lieu of Thesis (1-9) Developing, testing, and evaluating original educational technology, curricular materials, or an intervention program. S/U.

EDG 7222: Curriculum: Theory and Research (3) *Prereq: EDG 6250.* Theories of curriculum organization and a survey of curriculum research and patterns of curriculum.

EDG 7252: Perspectives in Curriculum, Teaching, and Teacher Education(3) Issues related to curriculum, teaching, and teacher education.

EDG 7665: Bases of Curriculum and Instruction Theory (3) *Prereq: EDG 6250 or equivalent.* Applies behavioral science theory and research to the development of curriculum and instruction theory. Topics include social forces, human development, and learning theories.

EDG 7941: Field Experience in Curriculum and Instruction (1-4; max: 10) *Prereq: open only to advanced graduate students.* Supervised experiences appropriate to the student's professional goals.

EDG 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with

a master's degree in the field of study or students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

EDG 7980: Research for Doctoral Dissertation (1-15) S/U.

EDH 6040: Theory of College Student Development(3) Examination of theories describing patterns of growth and development during college years.

EDH 6046: Diversity Issues in Higher Education (3) Models, theories, and skills for understanding multicultural students at the postsecondary level.

EDH 6048: Advising College Student Organizations (3) Advisement practices, student organization culture, and group development theories.

EDH 6049: Domestic and International College Student Services (3) Overview of higher education student services in the United States and international institutions.

EDH 6051: Educational Outcomes of American Colleges and Universities (3) Exploration of impact of postsecondary educational institutions and barriers to student development.

EDH 6053: The Community Junior College in America (3) Programs, issues, and problems.

EDH 6066: American Higher Education (3) History, philosophy, and policies, with emphasis on current practices and problems.

EDH 6067: Seminar: International Higher Education (3) Characteristics of selected foreign higher education systems with emphasis on history and philosophy, access, curriculum and instruction, student and faculty characteristics, governance, management, and finance.

EDH 6305: College and University Teaching (3) Contemporary issues, problems, and research related to the role of the college faculty member and the teaching-learning process.

EDH 6360: Foundations and Functions of College Student Personnel(3) Introduction to history, roles, and functions.

EDH 6361: Theories and Assessment of Higher Educational Environments (3) Examines theoretical approaches that define and describe various elements of higher educational environments.

EDH 6503: Resource Development in Higher Education (3) Exploration of financial resource development in higher education institutions and organizations.

EDH 6632: Current Issues in Community College Leadership (3) Case-based approach to examining current issues on community college campuses.

EDH 6637: Crisis Management in Higher Education (3) Introduction to real crisis situations. Students form emergency plans based on different crisis response models.

EDH 6931: Special Topics in Higher Education (1-3; max: 10)

EDH 6935: Seminar in College Student Personnel Administration (3) *Prereq: consent of instructor.* Culminating seminar integrating core curriculum and practitioner experience.

EDH 6945: Practicum in College Teaching I (3) *Prereq: prior arrangements must be made with the coordinating professor of the*

College of Education. Provision made for the student to teach under the supervision of a professor at either the community college, four-year college, or university level. Seminars cover topics related to improvement of college teaching.

EDH 6946: Practicum in College Teaching II (3) *Prereq: prior arrangements must be made with the coordinating professor of the College of Education.* Provision made for the student to teach under the supervision of a professor at either the community college, four-year college, or university level. Seminars cover topics related to improvement of college teaching.

EDH 6947: Practicum in Student Personnel (3; max: 6) *Prereq: adviser's consent, and written application to practicum coordinator.* S/U.

EDH 7225: Seminar: Curriculum in Higher Education (3) Issues and problems in college and university curricula. Curriculum planning, implementation, and evaluation.

EDH 7405: The Law and Higher Education (3) The legal structure of higher education, religion, academic freedom of faculty, employment, due process, students' rights of speech and expression, search and seizure, desegregation, and tort liability.

EDH 7505: The Financing of Higher Education (3) Junior college through university. Theoretical basis for use of tax funds for education, student fees and tuition, state methods for financing, planning, cost benefit, budgeting, federal role, and capital outlay.

EDH 7631: Administration of Instruction in Higher Education (3) Skills and knowledge for current and future college leaders.

EDH 7634: Student Affairs Administration in Higher Education (3) Major issues. Purposes, structure, program evaluation, and budgeting.

EDH 7635: Higher Education Administration (3) Educational policies, functions, and practices.

EDH 7916: Contemporary Research on Higher Education (3) Examination and analysis of research related to higher education. Implications for application of findings for improvement of colleges and universities.

EDH 7942: Group Supervision in Student Personnel (1; max: 5) *Prereq: written application to internship coordinator before registration.* S/U.

EDH 7948: Internship in Student Personnel (5) *Prereq: adviser's consent; and written application to internship coordinator before registration.* S/U.

EDS 6140: Supervision of Instruction (3) Systematic approaches to supervising instructional personnel including observation and programs of continuing professional development.

MHS 5005: Introduction to Counseling (3)

MHS 6000: Assessment and Treatment of Family Violence (3) *Prereq: MHS 6401.* Clinically oriented, research-based overview of assessing and treating family violence.

MHS 6020: Counseling in Community Settings (3) *Prereq: MHS 7800.*

MHS 6061: Spiritual Issues in Multicultural Counseling(3)

Spiritual/religious/transpersonal issues expressed in counseling from both client and counselor perspective.

MHS 6071: Diagnosis and Treatment of Mental Disorders (3) *Prereq: MHS 6400, 6401.*

MHS 6200: Assessment in Counseling (3) *Prereq: course in basic statistics.*

MHS 6340: Career Development (3)

MHS 6401: Counseling Theories and Applications (3) *Prereq: MHS 5005.*

MHS 6421: Play Counseling and Play Process with Children (3) *Prereq: MHS 6401.*

MHS 6428: Multicultural Counseling (3) *Prereq: MHS 6401.*

MHS 6430: Introduction to Family Counseling (3) *Prereq: MHS 6401, 7800.*

MHS 6440: Marriage Counseling (3)

MHS 6450: Substance Abuse Counseling (3)

MHS 6466: Trauma and Crisis Intervention: Theory and Practice (3) Theories and practice models related to trauma and crisis intervention.

MHS 6471: Sexuality and Mental Health (3) *Prereq: MHS 6400, 6401.*

MHS 6480: Developmental Counseling Over the Life Span (3)

MHS 6495: Counseling Lesbian, Gay, Bisexual, and Transgender Clients (3) *Prereq: MHS 5005, 6401; or EDA 6931 Diversity Issues in Higher Education and EDA 6931 Theory and Assessment of Student Development.* Explores lesbian, gay, bisexual, and transgender (LGBT) identity formation and theory, vocabulary, resources, and developmental life stages.

MHS 6500: Group Counseling: Theories and Procedures (3) *Prereq: MHS 6401.*

MHS 6602: Educational Mediation(3) Negotiation and mediation in educational and other settings.

MHS 6705: Professional, Ethical, and Legal Issues in Marriage and Family Counseling (3)

MHS 6720: Professional Identity and Ethics in Counseling (3)

MHS 6831: Supervision for a Split Internship (3; max: 6) *Prereq: adviser's consent, completion of practicum sequence, and written application to internship coordinator at least 6 weeks before registering. Coreq: MHS 7804, 7807, SDS 7820, or 7802.* Required first enrollment for students participating in internship over two semesters. S/U.

MHS 6905: Individual Work (1-4; max: 12) *Prereq: consent of instructor and graduate coordinator; approval of proposed project.*

MHS 6910: Supervised Research (1-5; max: 5) S/U.

MHS 6940: Supervised Teaching (1-5; max: 5) S/U.

MHS 6971: Research for Master's Thesis (1-15) S/U.

MHS 7402: Brief Therapy (3) *Prereq: 24 graduate-level credits in counseling and/or psychology, successful completion of practicum.* Examines contemporary theories of brief counseling and psychotherapy. Survey of theories, emphasizing application and research.

MHS 7407: Advanced Counseling Theories (3) *Prereq: enrollment in doctoral program.* Advanced preparation in individual, group, career, multicultural, and ecosystemic (marriage and family) theories of counseling.
MHS 7431: Advanced Family Counseling (4) *Prereq: MHS 6430.*
MHS 7600: Consultation Procedures (2) *Prereq: MHS 7800. Coreq: registration in practicum or internship.*
MHS 7610: Practicum in Counseling Supervision (4; max: 8) *Prereq: MHS 6401, adviser's consent, and written application to practicum coordinator at least 6 weeks before registration. Open only to advanced doctoral students.* S/U.
MHS 7730: Seminar in Counseling Research (3) *Prereq: satisfactory completion of EDF 6403.* Issues in designing and implementing counseling and psychotherapy dissertation research.
MHS 7740: Research in Counseling(3) *Prereq: MHS 6200.*
MHS 7804: Group Supervision in Agency Counseling (3; max: 15) *Prereq: written application to practicum/internship coordinator at least 6 weeks before registration. Coreq: MHS 7800, 6805; SDS 7380 or MHS 6831.* Clinical aspects of intervention for children and adults who have langugae disabilities, focusing on identification, diagnosis, and treatment of emergent literacy and language disorders. S/U.
MHS 7805: Practicum in Agency Counseling (3) *Prereq: MHS 5005, 6200, 6401, 6500, 6720. Coreq: MHS 6071, 6420, 6430.* S/U.
MHS 7806: Practicum in Marriage and Family Counseling (3) *Prereq: MHS 5005, 6200, 6401, 6500, 6720. Coreq: MHS 6071, 6420, 6430.* S/U.
MHS 7807: Group Supervision in Marriage and Family Counseling (3; max: 15) *Prereq: written application to practicum/internship coordinator at least 6 weeks before registration. Coreq: MHS 7800, 7806; SDS 7830 or MHS 6831.* S/U.
MHS 7830: Internship in Counseling and Development-600 Hours (5; max: 15) *Prereq: adviser's consent, completion of all practica required for M.Ed. or Ed.S. degree, and written application to internship coordinator at least 6 weeks before registering.* S/U.
MHS 7840: Internship in Counselor Education (6; max: 12) *Prereq: written application to internship coordinator at least 6 weeks before registration. Open only to advanced doctoral students.* S/U.
MHS 7946: Internship in Agency Program Management (6; max: 12) *Prereq: written application to internship coordinator at least 6 weeks before registration. Open only to advanced doctoral students.* S/U.
MHS 7979: Advanced Research (1-12) *Prereq: research for doctoral students before admission to candidacy.* Designed for students with a master's degree in the field of study or for students who have been admitted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
MHS 7980: Research for Doctoral Dissertation (1-15) S/U.
SDS 6401: Counseling Skills for Non-Counselors(3) Counseling skills in dyadic communication and in small groups.

SDS 6411: Counseling with Children (3) *Prereq or coreq: MHS 6401.*
SDS 6413: Counseling Adolescents (3) *Prereq: MHS 6401.*
SDS 6436: Family-School Intervention (3) *Prereq: MHS 5005, MHS 6401. Coreq: SDS 6411, 6413.* Examines common patterns of family-school interaction and the major types of family-school interventions used to support children's learning and development including school-wide interventions to engage families, parent and teacher case consultation, and family referral for community services.
SDS 6520: Family, Student Development and Role of Teacher as Adviser (3) Learning to be advisers to small groups of middle school students concerning personal and academic development.
SDS 6620: Organization and Administration of School Counseling Programs (3) *Prereq: SDS 6411.*
SDS 6831: Supervision for a Split Internship (3; max: 6) *Prereq: adviser's consent, completion of practicum sequence, and written application to internship coordinator at least 6 weeks before registering. Coreq: MHS 7804, 7807, SDS 7820, or 7802.* Required first enrollment for students participating in internship over 2 semesters. S/U.
SDS 6905: Individual Work (1-4; max: 12) *Prereq: consent of instructor and graduate coordinator; approval of proposed project.*
SDS 6936: Seminar in Counselor Education (3) *Prereq: consent of instructor. Open to doctoral students in department.*
SDS 6938: Special Topics (1-4; max: 12) *Prereq: consent of department chair.*
SDS 7800: Practicum in School Counseling (3) *Prereq: MHS 7800, SDS 6411; adviser's consent; and written application to practicum coordinator at least 6 weeks before registration. Coreq: MHS 5005, 6401, 6411, 6413, 6421, 6720.* S/U.
SDS 7820: Group Supervision in School Counseling (1; max: 5) *Prereq: written application to practicum/internship coordinator at least 6 weeks before registration. Coreq: MHS 7800, SDS 7800 or 7830, or MHS 6831.* S/U.
SDS 7830: Internship in Counseling and Development-600 Hours (5; max: 15) *Prereq: adviser's consent, completion of all practica required for M.Ed. or Ed.S. degree, and written application to internship coordinator at least 6 weeks before registration. Coreq: SDS 7802, MHS 7804, 7807, or SDS 7820.* S/U.

Educational Leadership

Educational Administration and Policy

Programs are offered in

--Educational Leadership (M.A.E., M.Ed., Ed.S., Ed.D. and Ph.D), with specializations in elementary and secondary administration and in policy

--Higher education administration (Ed.S., Ed.D. and Ph.D) with specializations in community college leadership and university leadership

--Student personnel in higher education (M.A.E. and M.Ed.)

Educational Psychology

EDF 6113: Educational Psychology: Human Development (3) Current research and theories in the area of human development.
EDF 6211: Educational Psychology: General (3) Basic principles, techniques, and research; designed for graduate students preparing to teach who have a minimal background in psychology.
EDF 6215: Educational Psychology: Learning Theory (3) *Prereq: consent of instructor.* Logic and methodologies of theories of learning.
EDF 6232: Principles of Learning and Instructional Practice (3) Topics include transfer of training, reinforcement, forgetting, and problem solving.
EDF 6355: Educational Psychology: Personality Dynamics (3) Dynamics of behavior and their implications for education, counseling and guidance, administration, family relationships, and social action.
EDF 7117: Affective Development and Education (3) *Prereq: EDF 6113 or equivalent.* Application of theory and research.
EDF 7146: Advanced Cognitive Development (3) *Prereq: EDF 6113.* Cognitive development theory and research.
EDP 6052: Cognitive Psychology Applied to Education (3) Introduction to cognitive-psychological research and applications to education.

Higher Education Administration

Educational Administration and Policy

Programs are offered in

--Educational Leadership (M.A.E., M.Ed., Ed.S., Ed.D. and Ph.D), with specializations in elementary and secondary administration and in policy

--Higher education administration (Ed.S., Ed.D. and Ph.D) with specializations in community college leadership and university leadership

--Student personnel in higher education (M.A.E. and M.Ed.)

Marriage and Family Counseling

Counselor Education

In all programs, the Master of Education degree (identified below by an

asterisk) is awarded only on completion of the Specialist in Education

degree; however, course work toward the Specialist in Education degree

completed after 72 semester hours is considered post-specialist's level

work. Program areas include

--School counseling and guidance (M.A.E., M.Ed.,* Ed.S., Ed.D., or

Ph.D.) for positions in elementary, middle, and secondary schools

--Mental health counseling (M.A.E., M.Ed.,* Ed.S., Ed.D., or Ph.D.)

--Marriage and family counseling (M.A.E., M.Ed.,* Ed.S., Ed.D., or

Ph.D.) for positions in community, private, educational, or business

and industry counseling agencies or settings.

The entry and advanced-level school counseling and guidance, mental

health counseling, and marriage and family counseling programs are

accredited by the Council for the Accreditation of Counseling and

Related Educational Programs. Candidates for admission are urged to

complete a course in basic statistics before entering a program.

Mental Health Counseling

Counselor Education

In all programs, the Master of Education degree (identified below by an

asterisk) is awarded only on completion of the Specialist in Education

degree; however, course work toward the Specialist in Education degree

completed after 72 semester hours is considered post-specialist's level

work. Program areas include

--School counseling and guidance (M.A.E., M.Ed.,* Ed.S., Ed.D., or

Ph.D.) for positions in elementary, middle, and secondary schools

--Mental health counseling (M.A.E., M.Ed.,* Ed.S., Ed.D., or Ph.D.)

--Marriage and family counseling (M.A.E., M.Ed.,* Ed.S., Ed.D., or

Ph.D.) for positions in community, private, educational, or business

and industry counseling agencies or settings.

The entry and advanced-level school counseling and guidance, mental

health counseling, and marriage and family counseling programs are

accredited by the Council for the Accreditation of Counseling and

Related Educational Programs. Candidates for admission are urged to

complete a course in basic statistics before entering a program.

Research and Evaluation Methodology

The research and evaluation methodology program includes the following areas of specialization:

--Research methodology
--Education statistics
--Measurement and evaluation

Co-major: The program offers a co-major program in conjunction with the Department of Psychology leading to the Doctor of Philosophy degree in research and evaluation methodology and psychology.

EDF 5441: Assessment in General and Exceptional Student Education (3) *Prereq: STA 3122.* Basic measurement concepts, designing classroom assessments, and interpreting results from traditional or alternative assessments; using these to plan instruction and evaluate student performance.
EDF 6400: Quantitative Foundations of Education Research Overview(3) *Prereq: STA 2023, STA 2122 or equivalent.* Overview of quantitative methods: validity, reliability, research design, and inferential statistics.
EDF 6401: Educational Statistics (3) *Prereq: STA 2023. Primarily for Ed.D. candidates.* Application to educational data and problems.
EDF 6402: Quantitative Foundations in Educational Research: Inferential Statistics (3) *Prereq: EDF 6400.* Analysis of variance: One-way ANOVA, two-way ANOVA, ANOVA, repeated measures, and split plot.
EDF 6403: Quantitative Foundations of Educational Research (6) *Prereq: STA 2023, 2122, or equivalent.* Integrated coverage of fundamentals in the general field of education research. Includes statistics, experimental design, and data processing.
EDF 6434: Educational Measurement (3) *Prereq: undergraduate statistics course.* Overview of educational measurement and testing, emphasizing cognitive ability and achievement testing.
EDF 6436: Theory of Measurement (4) *Prereq: STA 2023; EDF 4430.* Introductory study of true score models, reliability, validity, norms, scaling, item analysis, and basic elements of instrument construction.
EDF 6471: Survey Design and Analysis in Educational Research (3) *Prereq: EDF 6403.* Development and analysis techniques for surveys and questionnaires. Techniques of protocol development, data collection, analysis, and reporting.
EDF 6475: Qualitative Foundations of Educational Research (4) Introduction to philosophical, historical, sociological, and other methodologies as aspects of qualitative educational research.
EDF 6481: Quantitative Research Methods in Education (4) *Prereq: STA 2023, 2122 or equivalent.* Design and data analysis for

educational research.

EDF 6905: Individual Study (1-3; max: 12) *Prereq: consent of department chair.* For advanced students who wish to study individual problems in psychological, social, or philosophical foundations of education, or research and measurement under faculty guidance.

EDF 6910: Supervised Research (1-5; max: 5) *Prereq: consent of department chair.* S/U.

EDF 6938: Special Topics (1-3; max: 12) *Prereq: consent of department chair.*

EDF 6940: Supervised Teaching (1-5; max: 5) *Prereq: consent of department chair.* S/U.

EDF 6941: Practicum in Educational Research (2-9; max: 9) *Prereq: EDF 6403. Arrangements must be made with instructor before registration.* Experience in conducting various phases of quantitative or qualitative educational research under individual supervision.

EDF 6971: Research for Master's Thesis (1-15) S/U.

EDF 7405: Advanced Quantitative Foundations of Educational Research (4; max: 8) *Prereq: EDF 6403.* Integrated coverage of important approaches to educational research. Includes application of experimental design, regression analysis, and computer processing to selected educational research problems.

EDF 7412: Structural Equation Models (3) *Prereq: EDF 6436, EDF 7405.* Confirmatory factor analysis and causal models.

EDF 7435: Rating Scale Design and Analysis in Educational Research (3) *Prereq: EDF 6403 and 6434 or 6436.* Development and analysis techniques for questionnaires and rating scales. Applications of psychometric models to item, scale, and rater evaluation; bias detection; factor analysis; and measurement of change.

EDF 7439: Item Response Theory (3) *Prereq: EDF 6436.* Psychometric models for test scores; estimation of ability and item parameters; applications of and current issues in IRT.

EDF 7474: Multilevel Models (3) *Prereq: EDF 6403 or 6481 and 7405.* Models and methods for analysis of multilevel data.

EDF 7479: Qualitative Data Analysis: Approaches and Techniques (3) *Prereq: EDF 6475.* Theories, approaches, and techniques of qualitative data analysis.

EDF 7483: Qualitative Data Collection: Approaches and Techniques(3) *Prereq: EDF 6475.*

EDF 7486: Methods of Educational Research (3) *Prereq: STA 2023. Primarily for Ed.D. candidates.* Examination of research methodologies. Problem identification as well as organization and presentation of data.

EDF 7491: Evaluation of Educational Products and Systems (3) *Prereq: EDF 6403 or equivalent.* Models and methods for formative and summative evaluation of educational products and programs.

EDF 7639: Research in Educational Sociology (3) Research techniques in educational sociology, emphasis on ethnography.

EDF 7931: Seminar in Educational Research (3; max: 6) *Prereq: EDF 6403.* In-depth examination of specific methodological approaches to educational research.
EDF 7932: Multivariate Analysis in Educational Research (3) *Prereq: EDF 6403 and EDF 7405.* Review of selected studies, focusing on methods of data analysis. Emphasis on using multivariate techniques.
EDF 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
EDF 7980: Research for Doctoral Dissertation (1-15) S/U.

School Counseling and Guidance

Counselor Education

In all programs, the Master of Education degree (identified below by an asterisk) is awarded only on completion of the Specialist in Education degree; however, course work toward the Specialist in Education degree completed after 72 semester hours is considered post-specialist's level work. Program areas include

--School counseling and guidance (M.A.E., M.Ed.,* Ed.S., Ed.D., or Ph.D.) for positions in elementary, middle, and secondary schools

--Mental health counseling (M.A.E., M.Ed.,* Ed.S., Ed.D., or Ph.D.)

--Marriage and family counseling (M.A.E., M.Ed.,* Ed.S., Ed.D., or Ph.D.) for positions in community, private, educational, or business and industry counseling agencies or settings.

The entry and advanced-level school counseling and guidance, mental health counseling, and marriage and family counseling programs are accredited by the Council for the Accreditation of Counseling and Related Educational Programs. Candidates for admission are urged to complete a course in basic statistics before entering a program.

Student Personnel in Higher Education

Educational Administration and Policy

Programs are offered in

--Educational Leadership (M.A.E., M.Ed., Ed.S., Ed.D. and Ph.D), with specializations in elementary and secondary administration and in policy

--Higher education administration (Ed.S., Ed.D. and Ph.D) with specializations in community college leadership and university leadership

--Student personnel in higher education (M.A.E. and M.Ed.)

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Industrial and Systems Engineering

College of Engineering

Graduate Faculty

Chair: J. C. Hartman. *Graduate Coordinator:* J. C. Smith and S. X. Bai. *Complete faculty listing by department*: Follow this link

The Department of Industrial and Systems Engineering offers the Master of Engineering and the Master of Science degrees, each with a thesis or nonthesis option, with specialization in engineering management, manufacturing and logistics systems engineering, operations research, quality engineering, and special interest options such as health systems. In addition, the Department offers the Engineer degree and the Doctor of Philosophy degree with specialization in linear, combinatorial, nonlinear, and global optimization; supply chain management and e-commerce; financial engineering; manufacturing management; facilities location and layout; quality engineering; and stochastic processes.

Complete descriptions of the requirements for the M.E., M.S., Engineer, and Ph.D. degrees are provided in the *General Information* section of this catalog.

A degree in one of the engineering disciplines or in mathematics, statistics, physics, computer sciences, quantitative management, or similar fields is prerequisite. Where the student's background is deficient, an articulation program of foundation courses will be required.

The Department offers a combined bachelor's/master's degree program of B.S.I.S.E./Master of Science (Management), B.S.I.S.E./Master of Engineering or Master of Science, and a B.S. from disciplines within the

College of Engineering/Master of Science or Master of Engineering. Contact the graduate coordinator for information.

EIN 6227: Advanced Quality Management and Engineering for Business Processes (3) *Prereq: introductory statistics or consent of instructor.* Philosophy of continuous improvement and methodology for applying team problem solving to manufacturing and service industries. Hands-on application of basic statistical quality tools; introduction to quality function deployment; concurrent engineering; business process reengineering; process analysis; benchmarking. Team project.
EIN 6336: Advanced Production and Inventory Control (3) *Prereq: ESI 6417, 6429.* Production planning and control; problem identification and formulation. Mathematical theory of single- and multicommodity inventory systems; problem solving using dynamic programming and Markov chains.
EIN 6357: Advanced Engineering Economy (3) *Prereq: STA 4321.* Economic analysis of capital expenditure decisions. Financial mathematics and microeconomics. Decision under risk and uncertainty. Game theory and utility theory.
EIN 6367: Facilities Layout and Location (3) *Prereq: ESI 6417.* Planar and discrete layout problems and locations problems; network location problems. Single- and multi-objectives. Industrial and public sector applications.
EIN 6392: Manufacturing Management (3) *Prereq: ESI 6314 and undergraduate probability and statistics.* Variety and importance of management decisions. Total quality management, just-in time manufacturing, concurrent engineering, material requirements planning, production scheduling, and inventory control.
EIN 6905: Special Problems (1-6; max: 9) Laboratory, lecture, field work, or conferences.
EIN 6910: Supervised Research (1-5; max: 5) S/U.
EIN 6918: Graduate Seminar (1; max: 15) S/U.
EIN 6940: Supervised Teaching (1-5; max: 5) S/U.
EIN 6971: Research for Master's Thesis (1-15) S/U.
EIN 6972: Research for Engineer's Thesis (1-15) S/U.
EIN 7933: Special Problems (1-6; max: 12) Laboratory, lecture, field work, or conferences.
EIN 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
EIN 7980: Research for Doctoral Dissertation (1-15) S/U.
ESI 5236: Reliability Engineering (3) *Prereq: ESI 4567C, STA 4322.* Mathematical models and methods of reliability engineering. Typical component failure distributions; system reliability as a function of component reliability. Reliability block diagrams and fault trees.
ESI 6162C: Advanced Industrial Applications of Microprocessors (3)

Prereq: CGS 2425. Concepts of microprocessors; microcomputer architecture and languages. Interfacing and computational requirements. Applications to industrial and manufacturing systems. Emphasis on laboratory experiments and "hands-on" experience.

ESI 6314: Deterministic Methods in Operations Research (4) *Prereq: calculus through differential equations, knowledge of linear algebra, and experience using mainframes or PCs.* Introduction to basic models and their solution with modern computer packages. Emphasis on modeling, computer solution, and sensitivity analysis with minimal reference to model theory and development of algorithmic methods.

ESI 6321: Applied Probability Methods in Engineering (3) *Prereq: calculus, differential equations, undergraduate probability, and statistics.* Applied probability theory and statistics, reliability engineering, quality control, robust design, forecasting, Markov processes, and queuing theory.

ESI 6323: Models for Supply Chain Management(3) *Prereq: prior course work in linear programming, probability, and stochastic processes.* Essential elements including controlling and coordinating activities such as order processing, purchasing, material storage and handling, production scheduling, packaging, transportation, and setting customer service standards.

ESI 6355: Decision Support Systems for Industrial and Systems Engineers(4) *Prereq: programming course in C++ or Java and operations research.* Applications of decision support systems: developing and implementing systems arising in industrial and systems engineering using popular database management and spreadsheet software.

ESI 6417: Linear Programming and Network Optimization (3) *Prereq: matrix theory.* Formulation and solution techniques for network flow and linear programming problems. Algorithms for network optimization. The simplex method, theory and computation. Duality theory, sensitivity analysis.

ESI 6418: Linear Programming Extensions and Applications (3) *Prereq: ESI 6417, 6429.* Extension of linear programming to large scale linear and nonlinear problems. Integer programming methods. Applications of the methodology to real world models.

ESI 6429: Introduction to Nonlinear Optimization (3) *Prereq: ESI 6417 and multivariable calculus.* Nonlinear optimization models, convex sets and functions, optimality conditions, nonlinear algorithms, dynamic programming methods.

ESI 6448: Discrete Optimization Theory (3) *Prereq: linear programming and nonlinear optimization or equivalent.* Modeling with integer variables; enumeration and cutting plane methods; decomposition algorithms; branch and bound methods; computational complexity and software issues; special combinatorial optimization problems; parallel algorithms for integer programming.

ESI 6470: Principles of Manufacturing Systems Engineering (3) *Prereq: calculus through differential equations.* Introduction to modern manufacturing systems. Components of product and process design, computer-integrated manufacturing and automation. Current areas of development and research.

ESI 6492: Global Optimization (3) *Prereq: linear and nonlinear programming.* Properties of nonconvex functions, convex envelopes, and

duality. Complexity issues, applications of global optimization and software issues. Algorithms for quadratic programming. Concave minimization, Lipschitz optimization, and nonconvex network flow problems.

ESI 6529: Digital Simulation Techniques (3) *Prereq: computer programming and probability theory.* Computer programming aspects of digital simulation. Deterministic simulation; stochastic simulation. Use of simulation languages.

ESI 6533: Advanced Simulation Design and Analysis (3) *Prereq: ESI 6546, and a graduate-level course in statistical inference.* Fundamental concepts and techniques for stochastic simulation and applications in communications, transportation and manufacturing systems, and financial engineering. Discrete-event systems and Monte-Carlo evaluation.

ESI 6546: Stochastic Modeling and Analysis (3) *Prereq: STA 6326.* Stochastic processes, with emphasis on model building and probalistic reasoning. Review of elementary probability theory. Poisson process and renewal theory. Discrete and continuous time Markov chains. Brownian motions, random walks, and martingales. Applications in queuing, reliability, inventory theory, logistics, and finance.

ESI 6552: Systems Architecture (3) *Prereq: calculus, linear algebra, ESI 6xxxa.* Foundations for developing and evaluating architectures for systems of systems. Process for generating functional, physical, and operational architecture from a top-level operations concept.

ESI 6553: Systems Design (3) *Prereq: calculus, linear algebra, basics of statistics, ESI 6314.* Broad introduction to systems engineering and the structured approaches needed to design complex systems. Emphasizes formulation of systems problems and approaches to their solution. Introduces basic mathematical techniques for dealing with systems design.

ESI 6555: Systems Management (3) *Prereq: calculus, linear algebra, basics of statistics.* Introduction to the concepts of systems and the role of systems engineering in their development. Basic framework for planning and assessing system development, and how systems analysis methods and techniques are integrated into systems engineering processes.

ESI 6912: Advanced Topics in ISE (1-4; max: 8) *Prereq: consent of instructor.* Course work in specialized topics for graduate students.

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Information Systems and Operations Management

Warrington College of Business Administration

Graduate Faculty

Chair: G. J. Koehler. *Graduate Coordinator:* H. Cheng. *Complete faculty listing by department*: Follow this link

The Information Systems and Operations Management (ISOM) Department offers graduate courses leading to the Master of Science (M.S.) degree, with a major in information systems and operations management; the Ph.D. degree in business administration; and concentrations in the Master of Business Administration (M.B.A.) program. Requirements for these degrees are given in the *General Information* section of this catalog.

Master of Science: The M.S. program provides computing, analytical, and application skills to be used in a business setting. The primary areas of emphasis in the M.S. program are information systems/information technology and supply chain management. Requirements span traditional academic disciplines to produce a multiple-discipline focus. Typical positions for graduates include decision support specialist, information systems specialist, systems analyst, and logistic support specialist.

For a student with a bachelor's degree in business or economics, the M.S. non-thesis on-campus program consists of a minimum of 36 credit hours, normally requiring a minimum of three semesters of study, not including summer. Students without the prerequisite course work may need another semester.

All M.S. candidates must complete 26 credits of core coursework:

--GEB 5212: Professional Writing
--GEB 5215: Professional Communication
--ISM 6128: Advanced Business Systems Design and Development I
--ISM 6129: Advanced Business Systems Design and Development II
--ISM 6215: Business Database Systems I
--ISM 6222: Business Telecom Strategy and Applications I
--ISM 6223: Business Telecom Strategy and Applications II
--ISM 6257: Intermediate Business Programming
--ISM 6258: Advanced Business Programming
--ISM 6485: Electronic Commerce and Logistics (capstone course)
--MAN 6581: Project Management
--QMB 6358: Statistical Analysis for Managerial Decisions I
--QMB 6755: Managerial Quantitative Analysis I
--QMB 6756: Managerial Quantitative Analysis II.

All M.S. candidates must also complete 6-8 credits of track coursework for either the information technology or supply chain management track:

Information Technology Track
--ISM 6216: Business Database Systems II
--ISM 6236: Business Objects I
--ISM 6259: Business Programming
--ISM 6423: Data Analysis and Decision Support

Supply Chain Management Track
--MAN 6511: Production Management Problems
--MAN 6528: Principles of Logistics/Transportation
--MAN 6573: Purchasing and Materials Management

These required courses total 26 credit hours. In addition, each M.S. student must take a minimum of 12 additional hours of approved electives.
Bachelor/Master of Science: The Department also offers a combined bachelor's/master's degree program. This program allows qualified students to earn both the bachelor's and master's degrees, using 12 to 16 credit hours of graduate-level courses for both degrees.

Master of Science degree in Information Systems and Operations Management with a concentration in Supply Chain Mmanagement: This program concentration uses the latest technology to provide professionals with unique skills for integrating information technology into the study of supply chain management. This 20-month online program starts in September every year and allows students with Internet access "to attend classes" and interact with faculty and classmates via such technology as e-mail, DVD, streaming video, synchronous group discussion software, asynchronous class presentation software, and multimedia courseware. Students visit campus 1 weekend (Saturday-Sunday)

every 4 months.

Doctor of Philosophy: Admission requirements for the Ph.D. include

--A minimum grade point average of 3.2
--A minimum GMAT score of 650, or GRE scores acceptable to the program
--For nonnative speakers of English, submit an acceptable score on one of the following: TOEFL (Test of English as a Foreign Language: computer=213, paper=550, web=80), IELTS (International English Language Testing System: 6), MELAB (Michigan English Language Assessment Battery: 77), or successful completion of the UF English Language Institute program.

Students come from a variety of backgrounds, with the most common being engineering computer sciences, mathematics, business, and statistics. Students admitted for the Ph.D. choose to specialize either in information systems/information technology or in operations management. The course schedule taken by each student is always personalized to fit the background of the student and is developed in consultation with the Ph.D. program coordinator and/or chair of the dissertation committee. A typical program of study, assuming that the student has the required background in business, calculus, and Java programming is as follows. Common methodological and substantive courses (regardless of specialization) are taken by most students:

--COT 5405: Analysis of Algorithms
--ECO 7404: Game Theory for Economics
--ECO 7408: Mathematical Methods and Applications to Economics
--ECO 7115: Microeconomic Theory
--ESI 6417: Linear Programming and Network Optimization
--ESI 6546: Stochastic Systems Analysis
--ESI 6418: Linear Programming Extensions and Applications
--ISM 6257: Intermediate Business Programming
--ISM 6258: Advanced Business Programming
--ISM 6259: Business Programming
--MAR 7626: Multivariate Statistical Methods in Marketing
--MAS 4105: Linear Algebra
--MAA 5228: Modern Analysis I
--STA 6326: Introduction to Theoretical Statistics I
--STA 6166: Statistical Methods in Research (or equivalent).

In addition to these courses, doctoral students are also required to attend doctoral seminar courses as and when they are offered, attend theISOM Workshop series, and take any additional courses in their chosen field.

ISM 5021: Information Systems in Organizations (3) *Prereq:*

consent of instructor. Designed for MBA students. Introduction for graduate students with minimal microcomputer operation skills. Topics include the range of computer information technology available, language types and procedural languages, applications in organizations, management of resources, and trends. Students use microcomputers in the College's computing laboratories.

ISM 6022: Management Information Systems (2) Policy and management issues surrounding information systems in today's enterprises. Strategic use, organizational impact, project management, human resource issues, and other topics important to understanding information systems in business.

ISM 6123: Systems Analysis and Design (3) Examines the various activities performed when developing a new information system or upgrading an existing system.

ISM 6128: Advanced Business Systems Design and Development I (2) Object-oriented analysis and model specification for business software systems. Articulation of key requirements (data, processes, physical components, deployment) using logical modeling methodologies.

ISM 6129: Advanced Business Systems Design and Development II (2) *Prereq: ISM 6128 or consent of instructor.* Continuation of ISM 6128. Focuses on object-oriented design of systems. How to translate business requirements into specific task and component requirements.

ISM 6215: Business Database Systems I (2) *Prereq: ISM 6129.* Fundamentals of data storage and retrieval models for business applications. Data modeling and database design principles. Theoretical foundations and exercises presented for relational data model and SQL.

ISM 6216: Business Database Systems II (2) *Prereq: ISM 6215.* Continuation of ISM 6215. Focuses on implementation and programming issues.

ISM 6217: Database Management Systems (3) Designing and developing databases. Understanding the role of databases in meeting business information needs.

ISM 6222: Business Telecom Strategy and Applications I (2) Survey of networking technologies used in WWW and e-commerce. TCP/IP networks and related security, networking hardware, and Internet software standards.

ISM 6223: Business Telecom Strategy and Applications II (2) *Prereq: ISM 6222 or consent of instructor.* Introduces traditional telephony. Discusses issues companies face on consolidation of voice and data networks. Technological developments, product announcements, and market activity. Ultimate focus is on strategy of voice/data integration.

ISM 6224: Business Telecom Strategy and Applications III (2) *Prereq: ISM 6223 and 6129.* Telecommunications analysis and design. Both tactical and strategic issues concerning integration.

ISM 6226: Business Telecom Strategy and Applications (3) Introduction and overview of the field of business communications. Understanding telecommunications components and terminology

applied to business in this age of electronic communication.

ISM 6236: Business Objects I (2) *Prereq: ISM 6215, ISM 6222, and ISM 6259.* Overview of main tools for business objects in enterprise programming, with hands-on experience. Distributed object models, component architectures, design methodologies and patterns, languages and development environments, and databases and repositories.

ISM 6239: Business Objects II (2) *Prereq: ISM 6236.* Extends concepts and tools of ISM 6236 to include practical aspects of using business objects in enterprise systems. Focus on overview of ERP systems, proxies, proxy repositories, and wrapping legacy systems with objects.

ISM 6257: Intermediate Business Programming (2) Application in business systems. Classes, inheritance, polymorphism, interfaces, error handling, multi-threading, database connectivity, and their use in business information systems.

ISM 6258: Advanced Business Programming (2) *Prereq: ISM 6257.* Event-driven, component-based programming. GUI components, and client end system design and implementation in distributed systems, as well as database development, networking, security, and object-oriented concepts.

ISM 6259: Business Programming (2) *Prereq: ISM 6258.* An advanced system-implementation course to teach client end system design and implementation. Topics include object-oriented systems development, databases, networking, security, and web application development.

ISM 6423: Data Analysis and Decision Support(2) Overview of various solution methods for data analysis programs such as clustering, classification, and regression that occur in business decision making. How methods support decision making.

ISM 6485: Electronic Commerce and Logistics (2) Underlying technologies that herald innovations. How to capitalize on new electronic commerce and logistics in business.

ISM 6486: eCommerce Technologies (2) Database management systems, systems design and Web-page design, human computer interface issues, artificial intelligence methods (such as data mining and expert systems), and intelligent software agents.

ISM 6487: Risks and Controls in eCommerce (2) Strategic IT planning, policies and control; risk assessment, reliability, benchmarking and monitoring; privacy and security models and technologies; availability, continuity and compliance testing; and threat monitoring.

ISM 6942: Electronic Commerce Practicum (2) Projects such as developing e-commerce business plans, constructing e-commerce sites, etc.

ISM 7166: Advanced Business Systems Design and Development III (2) *Prereq: ISM 6129.* Continuation of ISM 6129. Focus on software project management and development. Exploration of object-oriented project management approach supported by computer-aided software engineering tool.

MAN 5501: Management (3) *Prereq: QMB 5305. Designed for*

MBA students. Introduction to the general class of problems associated with managing production facilities.

MAN 5502: Production and Operations Management (2) *Prereq: QMB 5305. Core course designed for traditional MBA students.* Introduction to POM, which focuses on design and control of productive systems within organizations.

MAN 6508: Management of Service Operations (2) Case studies and problems, including systems design, operation, and control. Emphasizes waiting-line systems.

MAN 6511: Production Management Problems (2) Problems in the management of industrial enterprise;. Management principles and mathematical analysis applied to manufacturing. Product development and production. Materials and production control. Employee relations.

MAN 6528: Principles of Logistics/Transportation Systems (2) *Prereq: QMB 6755.* Logistics management in current business environment.

MAN 6573: Purchasing and Materials Management (2) Industrial/institutional purchasing cycle for operating supplies, raw materials, components, and capital equipment in the context of materials management organizational concepts. Basic principles, policies, and procedures for requirement determination; procurement decision process; purchasing function; and materials management concept, organization, and philosophy.

MAN 6575: Purchasing and Supplier Relationship Management (3) Basic concepts and tools for purchasing and supply-chain management. Procurement cycle, information flow, supplier selection, and internet procurement.

MAN 6581: Project Management (2) Organizational role of the manager. Ways of structuring project organizations. Fundamentals of scheduling. Time and cost tradeoffs. Budgeting and cost estimation. Monitoring.

MAN 6586: Project Management (3) Principles, techniques, and methods used for effective project management.

MAN 6598: Logistics and Distribution Management (3) Activities that make products available to consumers at convenient locations, in the required quantities, and at minimum cost to the company.

MAN 6599: Tactical Logistics Planning (3) Distribution value chain planning, tactical logistics decisions in vehicle routing, inventory management, and value chain contracts.

MAN 6617: International Operations/Logistics (2) Global delivery/distribution channels, coordinating production/delivery operations in international markets, optimizing use of transportation networks, and designing information/communications systems that span supply chain.

MAN 6619: International Logistics (3) Strategic issues in managing international supply chains, managing the exchange rate, and the operating risks in global supply chains.

QMB 5303: Managerial Statistics (3) *Prereq: Basic statistics, calculus. Designed for M.B.A. students.* Basic concepts and methods

of probability and statistics, stressing applications in analyzing and solving business problems.

QMB 5304: Introduction to Managerial Statistics (2) Basics of modeling and analyzing problems that involve business decision making under uncertainty. Techniques for organizing and formulating decision problems. Probability theory and some basic statistical concepts and procedures.

QMB 5305: Advanced Managerial Statistics (2) *Prereq: Designed for M.B.A. students.* Builds on QMB5304. Basic concepts in collection, analysis, and interpretation of data, emphasizing the capabilities of different statistical methods and business applications. Focuses on how business decisions can be informed by statistical analysis and how to apply computer software tools to business decisions.

QMB 6358: Statistical Analysis for Managerial Decisions I (2) Data-application techniques for managerial problems; difficulties that can arise in applying the techniques and interpreting results. Experience using computerized procedures; may require substantial amount of case analysis.

QMB 6359: Statistical Analysis for Managerial Decisions II (2) *Prereq: QMB 6358 or consent of instructor.* Data application techniques with emphasis placed on relationships that occur over time. Substantial amount of case analysis, as well as applications programming using industry standard software products.

QMB 6607: Decision Processes Under Uncertainty I (2) *Prereq: consent of instructor.* Introduction to statistical decision theory, including the vonNeuman-Morgenstern behavioral axioms, forms, techniques for assessing probabilities, and penalty functions, with managerial and economic applications.

QMB 6616: Business Process Analysis(3) Critical business analytical approaches, including linear programming, project scheduling, waiting-line theory, and time-series analysis.

QMB 6693: Quality Management and Control Systems (2) *Prereq: QMB 5305 or equivalent or consent of instructor.* Philosophy of total quality management and technical aspects of quality design and measurement systems.

QMB 6697: Optimization in Simulation Modeling I (2) *Prereq: consent of instructor.* Use of simulation techniques in managerial decision problems, including random number generation and search procedures for determining optimal policies.

QMB 6755: Managerial Quantitative Analysis I (2) Survey of deterministic models for managerial decision making. Emphasizes mathematical programming.

QMB 6756: Managerial Quantitative Analysis II (2) *Prereq: QMB 6755.* Using deterministic and stochastic models for decision making. Integer and nonlinear programming, goal programming, multiple-objective linear programming, and decision theory. Applied problem solving and case studies, using appropriate software.

QMB 6905: Individual Work in Decision and Information Sciences (1-5; max: 10) *Prereq: consent of department.* Reading and/or research.

QMB 6910: Supervised Research (1-5; max: 5) S/U.
QMB 6930: Special Topics in Decision and Information Sciences (1-4; max: 16) Variable content. In-depth study of topics not offered in other courses or topics of special current significance.
QMB 6940: Supervised Teaching (1-5; max: 5) S/U.
QMB 6941: Internship (1-4; max: 6) Career-related experience that is not attainable in a classroom situation. Participation in such an internship will give employers an opportunity to identify earlier those students they may wish to employ upon graduation. S/U.
QMB 6957: International Studies in Quantitative Methods (1-4; max: 12) *Prereq: admission to an approved study abroad program and permission of department.* S/U.
QMB 6971: Research for Master's Thesis (1-15) S/U.
QMB 7931: Special Topics in Decision and Information Sciences (1-4; max: 9) *Prereq: consent of instructor.* Recent literature and state-of-the-art theory and methods in both the decision and the information sciences.
QMB 7933: Seminar in Decision and Information Sciences (1-4; max: 9) *Prereq: consent of instructor.* Historical foundations and evolutionary development of concepts in decision and information sciences, emerging problems and future trends.
QMB 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
QMB 7980: Research for Doctoral Dissertation (1-15) S/U.

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Interdisciplinary Ecology

School of Natural Resources and Environment

Graduate Faculty

Director of Academic Programs and Graduate Coordinator: S. R. Humphrey.

Graduate students are advised by one of the 300 members of the School's affiliate faculty and have a supervisory committee with interdisciplinary composition. For the list of Graduate Faculty, see http://snre.ufl.edu/people/affiliate.asp. Graduate students are hosted in one of 48 participating academic units.

The School offers a program of study leading to the Master of Science (thesis and nonthesis options), and Doctor of Philosophy degrees in interdisciplinary ecology. Minimum requirements for these degrees are given in the *General Information* section of this catalog.

These programs combine 1) course work in the basic and applied science of ecology and the social, political, and economic sciences; and 2) competence in a recognized discipline in one of these fields of study. The former is achieved with a core-course and distribution requirement. The latter is achieved by extra course work for the master's and a concentration for the doctoral degree. A thesis or dissertation provides first-hand experience creating reliable knowledge. The nonthesis master's option provides rapid, advanced preparation for the job market in 3 to 4 semesters, without research experience. Course requirements are 36 semester hours for the thesis option, 38 hours for the nonthesis option, and 60 hours beyond the master's degree for the doctoral degree.

Combined program: The master's degree is available as a 4-year-plus-1-year sequence to qualified seniors in the School's baccalaureate degree program in environmental science. These students may take up to 12 hours of approved graduate courses that count for both undergraduate and graduate credit. Combining with the thesis M.S. is likely to take more than 1 year.

Master's and doctoral students each take a course in principles of ecology, and a course in the ecology of a particular type of system. Students also undertake advanced study of three domains of thought integral to interdisciplinary ecology: resource-related natural sciences, environment-oriented social sciences, and sustainability studies. Requirements are given at http://snre.ufl.edu. Choices among 300 courses are custom-fitted by the student and the supervisory committee to meet the student's specific needs and interests.

Graduates understand the interaction of natural systems and society, and they are equipped with advanced education on ecological theory, methods, analysis, and applications. They have mastery of one discipline and the ability to communicate efficiently with specialists in other disciplines. This provides the intellectual capacity to address complex environmental and natural resource issues.

EVR 6320: Sustainable Natural Resource Management (3) *Prereq: one ecology course.* Principles and practices for sustainably managing natural resources (soil, water, forests, fisheries, biodiversity); systems, cases, models, drivers, scenario evaluation, adaptive learning, and collaborative decision-making.
EVR 6933: Seminar (1; max: 4) S/U.
EVR 6934: Internship (3; max: 6) Intensive workplace experience in business, government, or nongoverment organization related to a specific program of study. S/U.
EVR 6979: Nonthesis Master's Project(1-2; max: 2) Creating a technical paper involving analysis and synthesis, but not necessarily generating new data. S/U.
PCB 6971: Research for Master's Thesis (1-6) S/U.
PCB 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
PCB 7980: Research for Doctoral Dissertation (1-15) S/U.

Hydrologic Sciences

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Interior Design

College of Design, Construction, and Planning

Graduate Faculty

Chair: M. Portillo. *Graduate Coordinator:* M. Torres. *Complete faculty listing by department*: Follow this link

Doctor of Philosophy:
The College offers an interdisciplinary program leading to the Doctor of Philosophy degree in design, construction, and planning. Areas of specialization within this program include architecture, building construction, interior design, landscape architecture, and urban and regional planning. For information, write to the Ph.D. Director, College of Design, Construction, and Planning Doctoral Program, 331 ARCH, P.O. Box 115701.

Master of Interior Design:
The Master of Interior Design (M.I.D.) provides opportunities for students to direct their attention toward a variety of topics, including

--Design pedagogy and processes
--Sustainable, safe, and secure environments
--Creative performance and innovation
--Built heritage conservation.

Regardless of the study emphasis selected by the student, the M.I.D. program has a central focus with three categories of course work:

--Design studio

--Seminars in current interior design topics
--Theories and methods of research.

All M.I.D. students must complete an approved research topic with a written thesis. Requirements for the M.I.D. and Ph.D. degrees are given in the General Information section of this catalog.

Applications:
All applications must include acceptable GRE scores, transcripts for all previous academic work, and if the applicant's native language is not English, a satisfactory score on one of the following: TOEFL (Test of English as a Foreign Language: computer=213, paper=550, web=80), IELTS (International English Language Testing System: 6), MELAB (Michigan English Language Assessment Battery: 77), or successful completion of the UF English Language Institute. This information must be received in the Office of the Registrar by February 2. In addition to satisfying University requirements for admission, the applicants are required to submit to the Graduate Program Assistant, Department of Interior Design, 336 Architecture, P.O. Box 115705, University of Florida, Gainesville, FL 32611-5705, the following:

--A portfolio of your design work (if applicable). The portfolio must be accompanied by a self-addressed, stamped envelope.
--A written essay on your goals and aspirations related to graduate studies
--Three letters of recommendation.
--A personal interview is not required, but many applicants choose to visit the campus and Department as a part of the application process.

Students enrolled in the Bachelor of Interior Design program at the University of Florida may apply to the M.I.D. program during their junior year (see below).

The Department reserves the right to retain student course work for the purposes of record, exhibition, or instruction. Field trips are required for all students; students should plan to have adequate funds available. Students are required to purchase a computer for course work. It may be necessary to assess studio fees to defray costs of base maps, plans, and other generally used materials.

Admission: Applications are processed through February 2 for fall term and all applicants are encouraged to apply as soon as possible. Admission decisions are made between February and the end of April. All new students begin their studies in the fall to coincide with curriculum sequencing.

Graduate course requirements according to background: After assessment of previous design work, leveling courses may be required to prepare the student for the M.I.D. 36 hours of graduate

course work. Therefore, each student entering the Master of Interior Design program works with the graduate coordinator to evaluate the student's unique background to determine the specific courses needed to facilitate interest and experience. Estimated credit hours and length of study time vary according to each student's individual baccalaureate degree and experience.

There are four options.

--For students enrolled in the Bachelor of Design program at the University of Florida, 12 hours of graduate-level course work in the senior year can be counted for both the undergraduate and the M.I.D. degrees. An additional 24 graduate credit hours are required. Expect at least 1 additional year to complete the M.I.D.

--For students who graduated from a Council of Interior Design Accreditation (CIDA) accredited first professional degree program within an architectural framework, the course of study is estimated to be 36 graduate credit hours. Expect 2 years to complete the M.I.D.

--For students who graduated from a design-related (architecture or interior design) baccalaureate degree program, the course of study is estimated to be a maximum of 59 graduate credit hours (includes the 36-hour M.I.D.). Expect 3 years to complete leveling courses and the master's degree.

--For students with a bachelor's degree in a field other than design, the course of study is estimated to be 86 undergraduate and graduate credit hours. Expect 3 to 4 years to complete leveling courses and the M.I.D.

Estimates of the number of credit hours and length of study time may be adjusted based on the individual student's previous preparation including experience as a practicing designer, architect, or other professional.

Program requirements: After leveling courses are completed and with approval by the graduate coordinator and supervisory committee chair, a student completes 24 hours of departmentally approved graduate work in the Department of Interior Design. In addition, with the graduate coordinator's approval, the student is required to take 3 hours of course work in graduate statistics and 9 hours of multidisciplinary graduate electives that reinforce and extend the research.

Courses from such academic units as Psychology, Anthropology, Sociology, Engineering, Education, and Business Administration provide possible electives. The College of Design, Construction and Planning offers the Certificate in Historic Preservation. If the focus of a student is the renovation and preservation of built

environments, then historic preservation courses leading to a certificate would strengthen the research and design effort. Likewise, existing appropriate courses in Architecture, Landscape Architecture, Urban and Regional Planning, and Building Construction offer both collaborative study and research opportunities for M.I.D students.

Each student must select a two-member supervisory committee to guide course selection and to guide thesis selection, study, and production.

DCP 6211: Preservation Topics, Issues, and Practice(3) Focuses on a critical assessment of current preservation practices and how they can be applied to a sustainable future. Historic preservation of existing buildings and landscapes embodies the concept of sustainable architecture and landscape architecture.
DCP 6931: Special Topics in Design, Construction, and Planning(1-4; max: 6)
DCP 7790: Doctoral Core I (3) Philosophy, theory, and history of inquiry into the processes of design, urban development, and building systems.
DCP 7792: Doctoral Core II (3) *Prereq: DCP 7790.* Urban, environmental, and legal systems in the context of urban development.
DCP 7794: Doctoral Seminar (1; max: 4) *Coreq: DCP 7911; for entering Ph.D. students.* Successfully negotiating graduate school and writing a dissertation.
DCP 7911: Advanced Design, Construction, and Planning Research I (3) *Prereq: STA 6167. Coreq: DCP 7794; for entering Ph.D. students.* Survey and critical analysis of research in the disciplines of design, construction, and planning. Emphasizes theory and methods.
DCP 7912: Advanced Design, Construction, and Planning Research II (3) *Prereq: DCP 7911.* Conducting advanced research in architecture, design, landscape, planning, and construction.
DCP 7940: Supervised Teaching (1-5; max: 5) *Prereq: not open to students who have taken 6940.* Independent student teaching under the supervision of a faculty member. S/U.
DCP 7949: Professional Internship (1-5; max: 5) Professional faculty-supervised practicum.
DCP 7979: Advanced Research(1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
DCP 7980: Research for Doctoral Dissertation (1-15) S/U.
IND 5023: Introduction to Architectural Interiors (2) *Prereq: consent of graduate coordinator.* Overview of the profession. Designing interiors to enhance human activity while observing life safety codes and human performance. Examines significant interiors and furniture components.

IND 5106: History of Interior Design I (3) *Prereq: consent of graduate coordinator.* Design philosophy and interior elements in an architectural and sociological context. Record of human achievements expressed in built environment. Foundation for contemporary design and interior preservation practice. Slides, lecture, and discussion.

IND 5136: History of Interior Design II (3) *Prereq: IND 5106 or equivalent.* Continuation of IND 5106. Evolution of contemporary design philosophy. Foundation for contemporary design and interior presentation practice. Nineteenth-century revivals through current developments.

IND 5157: Preservation of Historic Interiors: Theory and Application (3) *Prereq: consent of graduate coordinator.* Research and implementation in preservation. Interior spaces, fixtures, and furnishings. Evolution of interior preservation theory and practice in U.S.

IND 5212C: Architectural Interiors I (5) *Prereq: consent of graduate coordinator. Coreq: IND 5427C and 5638.* Developing interior spaces from conceptual phases to final design resolution, based on the needs of people, interior considerations, and exterior influences. Emphasizes three-dimensional design development, process, and detailed graphic representation of designed spaces.

IND 5213C: Introduction to Architectural Interiors Lab (5) *Prereq: consent of graduate coordinator.* Designing micro-interior environments in relation to the architectural setting. Examines human perception, dimension, and spatial activity requirements. Explores the design process and graphic communication of interior design ideas.

IND 5227C: Advanced Architectural Interiors I (6) *Prereq: consent of instructor or graduate coordinator. Coreq: IND 5454C.* Advanced problems with respect to sophisticated clients in urban settings. Ranges from the infrastructure of large urban spaces to the details of individual spaces, including corporate office planning and design of both public and private spaces.

IND 5231C: Architectural Interiors II (5) *Prereq: IND 5212C or consent of instructor or graduate coordinator. Coreq: IND 5434C and 5508.* The conceptual design process, design theory, and programmatic concerns included in residential, commercial, and institutional interior design. Emphasizes professional applications and the interior designer as team player, programmer, and problem solver.

IND 5232C: Advanced Architectural Interiors II (6) *Prereq: IND 5227C or consent of graduate coordinator. Coreq: IND 5454C.* Advanced problems focusing on multiple phases of the design process through final design and detailing of each project. Final project demonstrates the highest level of design achievement.

IND 5317C: Interior Design Communication Systems (3) *Prereq: consent of graduate coordinator.* Conceptual process, design theory, and programmatic concerns involved in residential, institutional, and commercial interior design. Emphasizes visual communication techniques, including explanation of media, and

forms of visual communication and design concepts.

IND 5427C: Interior Design Construction Documents (4) *Prereq: consent of graduate coordinator.* Systematic overview of construction systems, technologies, and materials. Emphasizes the design of interior systems, and detailing of systems, as an extension of the overall design concept.

IND 5428: Materials for Interior Design (3) *Prereq: consent of graduate coordinator.* Characteristics, fabrication, and installation of interior materials. Environmental sustainability and indoor air quality. Architectural building and finish materials and furnishings.

IND 5434C: Interior Lighting (3) *Prereq: consent of graduate coordinator.* Introduction to lighting design based on critical awareness of luminous environment and principles and perception of light and color. Graphic exercises in lighting design, documentation, and lighting calculations based on student design project solutions.

IND 5445C: Furniture Design (3) *Prereq: consent of graduate coordinator.* Materials, joinery, and detailing of furniture for interior spaces. Design of custom furniture.

IND 5454C: Advanced Interior Design Detailing and Construction Documents (4) *Prereq: consent of graduate coordinator.* Advanced problems in interior finish systems, such as interior architecture and cabinetry exploration, and production of interior mechanical and millwork drawings and construction documents. Integration of building codes and life safety issues.

IND 5464C: Computer Applications in Three-Dimensional Design (3) *Prereq: consent of graduate coordinator.* Introduction to microcomputers as tools for illustration, drafting, and design development. Skills and technical knowledge in image processing, two-dimensional drawing, and three-dimensional modeling of interior architecture.

IND 5466: Interior Environmental Technology (3) *Prereq: consent of graduate coordinator.* Relation to human sensory reactions, psychological factors, health safety, and satisfaction. Vocabulary and concepts of interior environmental technology related to the process of design.

IND 5508: Business and Professional Practices for Interior Designers (3) *Prereq: consent of instructor or graduate coordinator.* The profession of interior design as practiced today. Considers office practices and design project management. Contract documents, legal concerns, management and marketing strategies, personnel practices, and career planning. Ethics/contracting for design services via case studies.

IND 5638: Theory of Interior Design (3) *Prereq: consent of graduate coordinator.* Introduction to significant theories concerning reciprocal interactions between people and interior architectural space. Theories, philosophies, and doctrines of design and exploration of their influences.

IND 5937: Current Topics in Interior Design (1-3; max: 6) Framework to support theory, research, and application of interior design processes. Programming and post-occupancy phases through exploration of environment and behavior research and gaming

simulation.

IND 6154: Preservation of Historic Interiors: Historic Interior Materials (3) *Prereq: IND 5157.* Historic interiors materials related to American historic periods of architecture and interior design.

IND 6239: Advanced Topics in Interior Design Studio (6; max: 12) Advanced design topics, building on student interest and selected faculty experience. Medical facilities, advanced lighting design, facility planning design.

IND 6639: Methods of Interior Design Research (3) *Prereq: graduate standing.* Theory and methods related to research in interior design, environment and behavior, and history. Reciprocal interactions between people and the built environment.

IND 6906: Independent Studies and Readings (1-3; max: 9)

IND 6940: Supervised Teaching (1-5; max: 5) S/U.

IND 6941: Interior Design Internship (2-4; max: 4) *Prereq: IND 5427C, 5232C, 5508.* Opportunities to work in an architectural and interior design office gaining hands-on professional experience working up to 12 weeks. S/U.

IND 6971: Research for Master's Thesis (1-6) S/U.

IND 6xxxC: Color Theory Planning and Practice (3) Explores color through a review of focused research and experiential learning. Examines the art and science of color theory in the context on interior design and allied fields.

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International Taxation

Fredric G. Levin College of Law

The Master of Laws in International Taxation (LL.M.I.T.) degree program offers advanced instruction for law graduates who plan to specialize in international taxation, in the practice of law. Degree candidates must complete 26 credits. Of these 26 credits, 22 must be graduate-level tax courses, and 13 must be graduate-level international tax courses, including a research and writing course.

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Landscape Architecture

College of Design, Construction, and Planning

Graduate Faculty

Chair and Graduate Coordinator: M. C. Gurucharri. *Complete faculty listing by department*: Follow this link

Doctor of Philosophy: The College offers an interdisciplinary program leading to the Doctor of Philosophy degree in design, construction, and planning. Areas of specialization within this program include architecture, building construction, interior design, landscape architecture, and urban and regional planning. For information, write to the Ph.D. Director, College of Design, Construction, and Planning Doctoral Program, 331 ARCH, P.O. Box 115701.

Master of Landscape Architecture: The M.L.A. is a fully accredited advanced professional degree and first professional degree. Graduation from an accredited program is an essential first step toward licensing in Florida and other states that regulate the practice of landscape architecture.

Requirements for the M.L.A. and Ph.D. degrees are given in the *General Information* section of this catalog.

The mission of the Department of Landscape Architecture is to advance the ethical, creative, and skillful application of the arts and the sciences in planning, designing, implementing, and managing landscapes of all types. The Bachelor of Landscape Architecture seeks excellence primarily through teaching and service. The Master of Landscape Architecture additionally emphasizes research.

Field trips are required as part of normal course work. Students should plan to have adequate funds for trips and studio materials. Students will be required to own personal computers with CAD graphics capabilities. Students should check with the Department for equipment specifications before purchase.

The program is flexible in meeting the needs of applicants with varied backgrounds. Students entering the graduate program in landscape architecture follow one of the four following tracks:

Graduates without design-related baccalaureate degrees:
For students with little to no background in design, a summer preparatory program is required that will aid in the development of basic analytical, design, and graphic skills. Having successfully completed this summer term, students advance into a two-semester sequence of articulation courses that provide a foundation of applied landscape design and planning theory as well as a foundation in landscape construction. A 7- to 10-day field trip is required during one semester. After this first year of articulation, students enter a 2-year program of advanced graduate study.

Graduates with design-related baccalaureate degrees: Students entering with a design background in a related field are normally required to enroll in a two-semester program that will transfer and enhance their analytical and design skills while providing a foundation in landscape architecture theory and practice. Students without course work or experience in site analysis and computer-aided design should enroll in summer preparatory courses in these areas of study before their first fall semester of study. The first two semesters of course work focus on landscape planning, design, and construction. A 7- to 10-day field trip is required during one semester. Having successfully completed this first year of instruction, students advance into a 2-year program of advanced graduate study.

Graduates with accredited professional baccalaureate degrees in landscape architecture: Those students having graduated from an accredited professional degree program in landscape architecture immediately enter a 2-year program of advanced graduate study.

Graduates with significant life experience in the practice of landscape architecture: Those persons who have a baccalaureate degree, preferably from an accredited program in landscape architecture, and a significant history of achievement in professional practice may tailor a program of advanced study to meet their specific needs. A minimum of 30 graduate credits is required for the M.L.A. degree.

With the exception of those applicants with significant life experience and practice in landscape architecture, the normal tenure

of graduate study is five semesters and includes a summer semester internship. Students complete at least 52 credit hours composed of lecture courses, seminars, design and construction studios, internship and individual study (special studies, supervised research, and thesis or project). This time period would be extended should a student elect to expand the course work or seek a concurrent degree in a related field.

Design studios: Three graduate design studios build on required lecture and seminar courses. The emphasis and issues addressed in the planning/design studios are user issues, both social and behavioral; issues of the region; the social, cultural, and natural context; and ecological issues from regional to site scales of concern. Each studio requires a student to develop a research component regarding project type, program/user analysis, and other resource data. Interdisciplinary and multidisciplinary collaborations are encouraged on both a formal and an informal basis. Graduate studio projects also deal with current issues related to the mission of the Department germane to research and community service.

Construction: Graduate landscape construction is ancillary to the design studio sequence. Project management methodologies, contract writing, production of bid documents, and material specification issues are explored. Use of computer technology is required.

Thesis or terminal project: We recognize that students have different professional goals and personal strengths and interests. A thesis is appropriate for students interested in further research or teaching, or in pursuing advanced degrees. A project (with a significant research component) is appropriate for students interested in design- or project-oriented aspects of landscape architecture, or if their specific areas of interest suggest a nontraditional approach.

Programs, centers, and institutes: The College of Design, Construction, and Planning has several research centers and institutes. The course work and summer sessions afforded by these programs offer both required and elective course work for graduate students in landscape architecture:

The Preservation Institute: Nantucket gives students an opportunity to receive specialized educational experience in a broad range of preservation topics using Nantucket as a resource for case-study projects.

The Preservation Institute: Caribbean gives students an opportunity to conduct and apply research regarding the conservation of the rich cultural traditions of the Greater Caribbean basin.

The GEOPLAN Center is dedicated to the development of geographic

and spatial information systems. Graduate students receive instruction in geographic information systems and are involved in a multidisciplinary studio that applies the tools and systems understanding afforded by GIS.

Graduate advisement: Students are initially to be advised by the Graduate Coordinator. He or she has guided the student's application through the acceptance process and is familiar with the student's background and needs. A plan of study is developed that includes required and optional courses. By the end of the second semester of study, each student is required to form a supervisory committee composed of two faculty members. The primary purpose of the graduate committee is to advise the student on educational objectives and the thesis or project course work.

Applications: Notify the Department of Landscape Architecture of your interest or intent to apply to the M.L.A. program, preferably by letter, fax, or e-mail. The Department will respond with additional program information. Submit the online application form accompanied by official transcripts, GRE scores, and TOEFL scores (applicants with English as a second language) to Office of the Registrar: Admissions Section, Criser Hall, University of Florida, Gainesville, Florida 32611. Concurrently, transcripts plus a letter of intent and three letters of recommendation should be submitted to the Program Assistant, Department of Landscape Architecture. Graduates with design-related baccalaureate degrees and with accredited professional baccalaureate degrees in landscape architecture must submit a portfolio representative of their academic and/or professional experience. (If the portfolio is to be returned, it must be accompanied by a self-addressed stamped envelope.) All materials should be submitted by the first of February preceding the date of proposed entry. Early submissions are encouraged.

Preparatory courses (see *Undergraduate Catalog*): *LAA 2330, LAA 2350, LAA 2360, LAA 2370, LAA 3420, LAA 3350, LAA 3352,LAA 3421, LAA 3550, LAA 6716, and ORH 3513.*

DCP 6931: Special Topics in Design, Construction, and Planning(1-4; max: 6)
DCP 7790: Doctoral Core I (3) Philosophy, theory, and history of inquiry into the processes of design, urban development, and building systems.
DCP 7792: Doctoral Core II (3) *Prereq: DCP 7790.* Urban, environmental, and legal systems in the context of urban development.
DCP 7794: Doctoral Seminar (1; max: 4) *Coreq: DCP 7911; for entering Ph.D. students.* Successfully negotiating graduate school and writing a dissertation.
DCP 7911: Advanced Design, Construction, and Planning Research I (3) *Prereq: STA 6167. Coreq: DCP 7794; for entering*

Ph.D. students. Survey and critical analysis of research in the disciplines of design, construction, and planning. Emphasizes theory and methods.

DCP 7912: Advanced Design, Construction, and Planning Research II (3) *Prereq: DCP 7911.* Conducting advanced research in architecture, design, landscape, planning, and construction.

DCP 7940: Supervised Teaching (1-5; max: 5) *Prereq: not open to students who have taken 6940.* Independent student teaching under the supervision of a faculty member. S/U.

DCP 7949: Professional Internship (1-5; max: 5) Professional faculty-supervised practicum.

DCP 7979: Advanced Research(1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

DCP 7980: Research for Doctoral Dissertation (1-15) S/U.

LAA 5331: Site Design Methodologies (3) Learn, develop, and refine methodologies to effectively evaluate relevant natural, social, and cultural characteristics of a site and its context as an integral part of the planning and design process.

LAA 5366: Principles of Landscape Architecture (5) Explores the range of introductory landscape architectural issues. Site design incorporating a mixture of cultural, environmental, and historic topics.

LAA 6231: Landscape Architecture Theory (3) *Prereq: consent of instructor. Coreq: LAA 6656C.* Explores theories pertinent to the practice and study of landscape architecture. Aesthetic and cultural principles and values and related ecological aspects. Designated core course.

LAA 6322: Project Management for Landscape Architects (3) Two-part exploration of current methods, theories, and approaches to critiquing and evaluating built and proposed environments and their users. Designated core course.

LAA 6342: Landscape Architecture Criticism (3) Case studies and readings of theories, models, and processes applicable to landscape architectural planning and design. Emphasizes the issues of perception, preference, and other user concerns. Designated core course.

LAA 6382: Ecological and Environmental Policy (3) Survey of major environmental policy and law with particular reference to Florida case studies. Designated core course.

LAA 6525L: Advanced Landscape Construction Design (4) Development of current communication and production techniques related to professional landscape architectural construction documentation.

LAA 6536: Landscape Management (3) Survey of large and small scale management issues including principles of landscape ecology and site maintenance.

LAA 6656C: Advanced Landscape Architectural Design (1-6; max: 18) Complex project design. Emphasizes user issues,

ecological concerns, and regional and cultural issues; and determination of form for sustainable environments.

LAA 6716: History of Landscape Architecture (3) History of man as expressed in urban form, gardens, parks, and public spaces.

LAA 6905: Directed Study (1-3; max: 9)

LAA 6931C: Special Topics (1-3; max: 6) Development of a current design opportunity. May be in collaboration with a professional office.

LAA 6933: Topics in European Design: Paris, France (4) *Coreq: LAA 6952C.* Urban form and its relation to history, ecology, and culture.

LAA 6935: Gardens of the World (3) Explores the garden as a complex expression of human relationships with each other and the larger environment, both physical and cultural.

LAA 6941: Supervised Internship (3) *Prereq: required for all students who do not document a landscape architectural experience.* Work is to be supervised by a registered landscape architect. Internship is to be accomplished in summer between first and second years or second and third years. Students, after completion, register in the next fall term for credit. S/U.

LAA 6952C: European Landscape Architecture Studio (5) *Coreq: LAA 6933.* Studio to explore classical and ecological design methodologies in European landscape.

LAA 6971: Research for Master's Thesis (1-15) S/U.

LAA 6979: Terminal Project (1-6) This option, in lieu of thesis, is available for a design project that because of magnitude or design complexity does not adapt to thesis format. S/U.

LAA 6xxx: Water Conservation through Site Design and Green Roofs (3) Exploration of the impacts of development on the natural systems of a site, particularly water resources. Mitigation of these impacts through sustainable site planning and design methodologies.

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Languages, Literatures and Cultures

College of Liberal Arts and Sciences

FOL 6326: Technology in Foreign Language Education (3) *Prereq: SPN 6943, FRE 6943, or equivalent.* Technology in classrooms. The interface between pedagogy and technology. **FOW 6930: Special Study in Romance Languages and Literatures (1-3; max: 9)** Rotating topics in literary theory, cultural studies, or literary study involving two or more Romance languages.

French

The Department of Language, Literature & Cultures offer programs leading to the Ph.D., with a concentration in French, and the M.A. in French. Minimum requirements for the M.A. and Ph.D. degrees are given in the General Information section of this catalog.

Candidates for the master's degree in French have two options: literature and culture, or language and linguistics. Prerequisite for admission to graduate work is an undergraduate major in the language, including advanced courses in both literature and language, or the equivalent.

All M.A. and Ph.D. students in French must take Introduction to Graduate Study and Research (FRW 6805). All M.A. and Ph.D. students in French must take Romance Language Teaching Methods (FRE 6940, 6943). All French M.A. Option A candidates are strongly

urged to take French Critical Theory (FRW 6825) in addition to the two required courses mentioned above. Option B linguistics students must take either History of the French Language (FRE 6845) or Introduction to Romance Linguistics (FOL 6735), French Phonetic and Phonology (FRE 6785), Sociolinguistics of French (FRE 6827), and Structure of French (FRE 6855). Other requirements vary with degree and specialization. For details, consult the appropriate graduate coordinator. The Department is able to offer most students a teaching assistantship that covers tuition and provides a maintenance stipend. Contingent on positive performance in teaching and graduate work, normally a master's student has at least four semesters of support and an M.A./Ph.D. student has at least ten. In addition there are several fellowships for which students may apply.

Incoming students are encouraged to apply as early as possible, preferably a full year ahead, since some deadlines for submitting applications occur during the fall of the year prior to enrollment. All materials for applications to either program must be sent by February 1 (international applicants) or April 1 (domestic applicants). For current information about graduate programs in the Department, visit http://www.languages.ufl.edu/french/index.html.

The combined B.A./M.A. programs in Spanish and French allow up to 12 graduate credits to be double counted toward fulfillment of both degrees. Contact the graduate coordinator for qualifications and details.

FRE 6060: Beginning French for Graduate Students I (3) For students with no formal preparation who need a reading knowledge. S/U.
FRE 6061: Beginning French for Graduate Students II (3) *Prereq: FRE 6060 or equivalent.* For students who need proficiency in reading. S/U option.
FRE 6466: Advanced Translation and Stylistics (3) Translation from English to French and French to English. Texts selected from modern authors. Various genres and styles.
FRE 6735: Special Studies in French Linguistics (3) Rotating topics relevant to second language acquisition, sociolinguistics, and/or theoretical linguistics.
FRE 6785: French Phonetics and Phonology (3) Introduction to French phonological processes. Explanatory evidence: production of speech sounds, classification of sounds, and their interrelationships (gliding, nasalization, assimilation). Morphological and syllable structure. Specifically French phenomena: liaison, elision, final consonant drop, schwa drop. Relationship of morphology to phonology, especially verb system.
FRE 6827: Sociolinguistics of French(3) Sociolinguistic issues in the French-speaking world: language variation, discourse analysis, attitudes toward varieties of French, and contact with speakers of other languages.

FRE 6845: History of the French Language (3) Phonological, morphological, syntactic, and lexical evolution of French language.
FRE 6855: Structure of French (3) Explores the French language as a system of communication and mental representation. Analyzes morphological, syntactic, and semantic aspects of contemporary French. Emphasizes historical, psychological, and sociological dimensions of linguistic investigation.
FRE 6940: Supervised Teaching (1-5; max: 5) Practical training in teaching elementary French courses. S/U.
FRE 6943: Romance Language Teaching Methods (2, 4, 6; max: 6) *Prereq: graduate standing.* Required for students needing practice and direction in college-level teaching.
FRE 6945: Practicum in Advanced College Teaching (2; max: 6) Practical training and orientation for advanced doctoral students in teaching upper-division courses. Gain upper-level teaching experience by working closely with a mentor in all areas of the teaching process. S/U.
FRE 6956: Overseas Studies in French (1-5; max: 5) *Prereq: permission of graduate coordinator (French).* Course work in French as part of approved study-abroad program.
FRW 6217: Seventeenth-Century French Prose (3) Major prose works of the classical period. Fermentation in philosophical and moral thought that characterized early modern period France. Cartesian thought, new science, Jansenism, libertines, and moralistes. Also includes texts by La Fayette and Sevigne.
FRW 6276: Readings in Eighteenth-Century Literature(3) Rotating topics: theater, novel, image of the Orient, Anglo-French connection, women writers of the Old Regime.
FRW 6288: Twentieth-Century French Novel (3) Analyzes representative novels. Emphasizes literary modernism, surrealism, and the new novel in light of pertinent cultural discourses and literary history.
FRW 6315: Seventeenth-Century French Drama(3) Theory and practice of dramaturgy in classical period as reflected in plays of Corneille, MoliÃ¨re, and Racine. Close textual analysis to disengage aesthetic and ideological problematics posed by each play.
FRW 6328: Twentieth-Century French Theater (3) Critical and historical study of representative plays. Theater as a genre and a cultural and political space. Discussion of theoretical writings. Viewing of selected plays on film.
FRW 6346: French Poetry of the Renaissance (3)
FRW 6355: Modern French Poetry (3) Historical approach combined with close readings of poetic texts. Introduction to numerous theoretical and critical writings. In addition to poetic texts taken from traditional cannon, less frequently taught poets are presented.
FRW 6396: French Cinema (3) Critical and historical study of representation of gender and ethnicity in French films.
FRW 6416: Later French Medieval Literature(3)
FRW 6536: The Romantic Period(3) Development and main tenets of 19th-century French Romanticism. Various themes and

genres (novel, poetry, theater, etc.) exploited by "romantic" artists. Socioeconomics and cultural matrices fostering movement. Relationship between literature and visual arts. Constructions of gendered, cultural, and artistic subjectivities. Exoticism (spatial, temporal, and mystic voyages). Representations of Paris and French society.

FRW 6556: French Realism and Naturalism (3)

FRW 6715: The Philosophic Movement (3) Readings from major figures such as Voltaire, Montesquieu, Diderot, and Rousseau. Historiography of the period. Key issues of Enlightenment (religious tolerance, slavery, women's rights, etc.). Key institutions of the 18th century (encyclopedia, newspaper, salon).

FRW 6780: Studies in Francophone Literature and Culture (Excluding the Caribbean and Sub-Saharan Africa (3; max: 9) Literature and cultures of the Francophone world. Quebec, North Africa, Vietnam, the Middle East, Belgium and Switzerland, or regions of France.

FRW 6805: Introduction to Graduate Study and Research (3) Tools, problems, and methods of literary and linguistic research.

FRW 6825: French Critical Theory (3; max: 6) Review and comparative analysis of approaches to literature from Romanticism to Deconstruction. Act of reading and writing examined through eyes of Sainte-Beuve, Taine, Lanson, Bachelard, Geneva School, Ricoeur, Bataille, Blanchot, Barthes, Foucault, Genette, Lacan, Kristeva, Todorov, Derrida, and others. Rotating topics.

FRW 6900: Special Study in French Literature (3; max: 9) Selected topic or problem (varied each semester).

FRW 6905: Individual Work (1-3; max: 9) *Available only by special arrangement with graduate adviser.*

FRW 6910: Supervised Research (1-5; max: 5) S/U.

FRW 6938: Seminar in French Literature (3; max: 15) Intensive research study of an author or topic.

FRW 6971: Research for Master's Thesis (1-15) S/U.

FRW 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

FRW 7980: Research for Doctoral Dissertation (1-15) S/U.

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Latin American Studies

College of Liberal Arts and Sciences

Graduate Faculty

Director: C. D. Deere. *Graduate Coordinator:* R. F. Brown. *Complete faculty listing by department*: Follow this link

The Center for Latin American Studies offers the following graduate programs:
--An interdisciplinary Master of Arts degree
--Graduate certificate and advanced graduate certificate in Latin American studies in conjunction with disciplinary degrees in the Colleges of Agricultural and Life Sciences; Design, Construction, and Planning; Business Administration; Education; Fine Arts; Journalism and Communications; Law; and Liberal Arts and Sciences.

The graduate program in Latin American studies relies on over 250 courses with Latin American content taught in more than 35 academic units of the above colleges. The degree and certificate programs in Latin American studies are described in the *Interdisciplinary Graduate Programs* section of the *Graduate Catalog* and at the website http://www.latam.ufl.edu/academic/grad.html. Complete course listings are available at the Center for Latin American Studies (319 Grinter Hall) and website.

AMH 6588: Latino/a Culture in the U.S. (3) Historical overview of the development of Latino/a culture in the USA.
FOT 6804: Translation for Diplomacy, Law, and European Issues (3) *Prereq: FOT 6805.* International, hemispheric, and European Union issues in translation. Government translation

included.

FOT 6805: Theory and Practice of Translation (3) *Prereq: consent of instructor.* Theory, history, and practice of translation, focusing on approaches to acquisition of translational skills.

FOT 6811C: Terminology and Computer-Assisted Translation(3) *Prereq: FOT 6805.* Theoretical and practical aspects of terminology management and computer-assisted translation (CAT). Training in computer-assisted translation, including use of CAT tools.

FOT 6815: Translation for the Professions(3) *Prereq: FOT 6805.* Technical, contractual, film, multi-media, and medical translation.

FOT 6940: Translation Studies Practicum(3) *Prereq: FOT 6805.* Practical training for free-lance or job environment, using computer-assisted translation tools. By working closely with a mentor, professional experience in translation is acquired.

LAS 6220: Issues and Perspectives in Latin American Studies (3) Overview of the economic and political history of Latin America, the history of thought about Latin American development problems, and US-Latin American relations during the 19th and 20th centuries.

LAS 6290: Tropical Conservation and Development(3; max: 6) Patterns and trends of tropical resource use and conservation analyzed against sustainability criteria. Socioeconomic, biological, and political factors addressed with emphasis on global linkages.

LAS 6291: Conservation and Development Skills(3; max: 6) Development of technical knowledge and interpersonal skills necessary for conservation and development professionals. Professional presentations, facilitation, workshop organization, and negotiation skills.

LAS 6292: Tropical Conservation and Development Research Methods (3; max: 6) Introduction to field research methods for studies focused on natural resource use and management by local populations in tropical regions. Emphasizes participatory approaches and integration of natural and social science tools.

LAS 6293: Design and Methods of Research in Latin American Studies (3) Readings and exercises introducing the main quantitative and qualitative strategies that social scientists use to carry out research in Latin America.

LAS 6295: Latin American Business Environment (2) *Prereq: M.B.A. core.* Examination of the contemporary political economy of Latin America from a business perspective. Analysis of economic, social, political, and cultural factors affecting business and finance in the region. Special attention to recent market reforms and regional integration.

LAS 6296: Latin American Business Topics (2-4; max: 4) *Prereq: M.B.A. core and LAS 6295.* Examination of various economic, management, finance, and legal topics affecting business and finance in Latin America.

LAS 6905: Individual Work (1-3; max: 9) Reading or research in topics focusing on a Latin American area, but cutting across disciplines.

LAS 6938: Seminar in Modern Latin American Studies (3; max: 9) *Prereq: Latin American area concentration. Coreq: required seminar for M.A. students in LAS.* Analyses of Latin American Studies with special focus on development and democracy in Latin America and the different perspectives and approaches within LAS to understand these issues. Different course sections are taught under this number, including Cuba, Change, and Continuity; Mexican Icons; and Research Design and Methods.

LAS 6940: Tropical Conservation and Development Practicum (3; max: 6) Design and organize an independent service-oriented project, beyond thesis research, on- or off-campus, illustrating leadership and collaboration, engaging others in workshops, outreach, and other practical activities. S/U.

LAS 6971: Research for Master's Thesis (1-15) S/U.

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Linguistics

College of Liberal Arts and Sciences

Graduate Faculty

Chair: C. R. Wiltshire. *Graduate Coordinator:* R. Wayland.
Complete faculty listing by department: Follow this link

Linguistics offers graduate programs leading to the M.A. and Ph.D. degrees with specializations in

--The core areas of the discipline (phonetics, phonology, syntax, discourse, semantics, morphology, language and gender, cross-cultural communication, linguistic change)

--Applied linguistics (sociolinguistics, second language acquisition, psycholinguistics, neurolinguistics).
Requirements for these degrees are given in the General Information section of this catalog.

The Certificate in Teaching English as a Second Language is offered to degree-seeking students in applied linguistics and related disciplines.

Applicants with deficiencies in linguistics must fulfill the prerequisites before their graduate work in the field. These deficiencies can be met by taking LIN 3010, LIN 3201, and LIN 3460 or the equivalent.

For detailed information on the programs, including financial aid, please go to the website http://web.lin.ufl.edu or contact Linguistics by telephone (352) 392-0639, by fax (352) 392-8480, by e-mail

ratree@ufl.edu, or by mail addressed to Linguistics, P.O. Box 115454, University of Florida, Gainesville, FL 32611.

As part of its service to the University community, Linguistics also offers programs for international applicants and admitted students. These programs, the English Language Institute (ELI), Academic Written English (AWE), and Academic Spoken English (ASE), are described in the General Information section of this catalog. This information, along with links to the application form, are available at http://web.lin.ufl.edu.

LIN 6226: Advanced Phonetics (3) *Prereq: LIN 4205 or LIN 6208 or SPA 3011.* Exposes students to advanced issues in linguistic phonetics, and to experimental phonetic methods and designs.
LIN 6707: Psycholinguistics (3) Explores basic issues in psycholinguistic research, including language production, comprehension, acquisition, and development.
LIN 6708C: Methods in Psycholinguistics (3) *Prereq: LIN 6702; STA 2023 or consent of instructor.* Hands-on experience designing and conducting psycholinguistic experiments and analyzing experimental data.
LIN 6741: Applied English Grammar (3) Survey of English grammar based on the principles of second language acquisition and social interaction, with implications for teachers.
LIN 6773: Topics in Computational Linguistics (3) *Prereq: consent of instructor.* Overview of the field of natural language processing and computational linguistics.
LIN 6796: Cognitive Neuroscience of Language(3) Overview and critical evaluation of brain imaging techniques and issues in language and brain research, covering speech perception, word recognition, reading syntax, discourse processing, production, language acquisition, and bilingualism.
LIN 6856: Semantics II(3) *Prereq: LIN 6804* Introduction to doing formal semantics for linguists, based on the theory of Richard Montague and theories developed within his approach.
TSL 6171: TESL I: Materials and Techniques (3) Theories of TESL teaching methods and materials. Instruction in classroom materials. Observation of ESL classroom procedures.
TSL 6172: TESL II: Materials for Special Purposes(3) *Prereq: TSL 6171.* Continuation of TSL 6171. Instruction in designing courses and programs in ESL. Each student will be required to develop a sample ESL course.

Applied Linguistics

LIN 5657: Gender and Language (3) *Prereq: LIN 3010.* Language in the construction of cultural, sex, and gender roles within a culture. A focal point is the grammaticalization of gender in languages of the world including non-Indo-European languages, and of the interactions of these grammatical structure with gender stereotypes. Consequences for linguistic science.

LIN 6601: Sociolinguistics (3) *Prereq: LIN 6323, 6501.* Major approaches to language in context: ethnographic, sociological, linguistic. Applications of sociolinguistics to applied linguistics, social sciences, and education. Collection and analysis of data.
LIN 6622: Bilingualism (3) Psycholinguistic and sociolinguistic aspects of bilingualism, with implications for education.
LIN 6720: Second Language Acquisition (3) Neurolinguistic, psycholinguistic, and sociolinguistic bases of second language acquisition in childhood and adulthood.
LIN 7641: Seminar in Language Variation (3; max: 9) Possible topics include variation theory, conversational interaction, language contact, bilingualism, and pidgins and Creoles.
LIN 7725: Topics in Second Language Acquisition (3; max: 6) *Prereq: LIN 6720.* Focused topic in the area of second language acquisition.

Linguistics Core

LIN 6039: Studies in Etymology: The Roots of English(3) *Prereq: 1 year of foreign language (preferably Latin or French).* Word formation and change in form and meaning, linguistic (Indo-European, Germanic) background of English, sociocultural history of English in England, and input from classical sources.
LIN 6084: Introduction to Graduate Research (3) Scholarly and scientific approaches to study of linguistics. Scientific method, theory development, data processing, scholarly writing, and structure of research proposals.
LIN 6128: Historical Linguistics (3) *Prereq: LIN 6323, 6501.* Principles and methods of historical and comparative linguistics, development of competing models for language change and linguistic relatedness. Examples and problems from a broad spectrum of the world's languages.
LIN 6129: Issues in Historical Linguistics (3) *Prereq: LIN 6341, 6520, 6128.* Advanced diachronic linguistics. The mutual interdependence of diachronic and synchronic analyses of language.
LIN 6165: Field Methods (3) *Prereq: LIN 3201.* Developing the basic linguistic skills of discovering the structure of a language previously unknown to the investigator, starting with paper and pencil. Students learn to listen and interact with a native speaker, to construct questions, to organize and analyze data, to construct and test hypotheses, and to write up discoveries. Emphasizes ethics as a requisite of good science.
LIN 6208: Phonetics for Linguists (3) Understanding of issues in experimental phonetics and appreciation of research techniques in the acoustic, physiological, and perceptual study in speech.
LIN 6323: Phonology (3) *Prereq: LIN 3201.* Phonemics, syllabic and prosodic phenomena, neutralization, distinctive features, morphophonemic alternation, phonological systems and processes. Terminology and notational conventions of generative phonology. Problems from a variety of languages.
LIN 6341: Issues in Phonology (3) *Prereq: LIN 6323.* Theoretical

approaches to major problems of phonological theory and/or its relationship to areas such as morphology and SLA. Emphasis on linguistic argumentation and independent research.

LIN 6402: Morphology (3) *Prereq: LIN 3460.* Theory of word structure, derivation, and inflection. The position of morphology in a grammar, the relationship between morphology and the rest of the grammar, predictions of various theories of morphology. Examples and problems from a wide variety of the world's languages.

LIN 6410: Issues in Morphology (3) *Prereq: LIN 6402.* Technical articles from a variety of twentieth-century schools. Prominent inquiries include the place of morphology in grammar, its relationship with other components, and whether a unified theory of morphology can be constructed.

LIN 6501: Syntax (3) *Prereq: LIN 3460.* The generative-transformational model of syntax: phrase structure, lexicon, case and agreement, movement, government, and anaphora. Emphasiezs problem solving and linguistic argumentation.

LIN 6520: Issues in Syntax (3) *Prereq: LIN 6501.* Further investigation of the generative-transformational model of syntax: advanced clause structure, binding theory, constraints on movement, and logical form.

LIN 6562: Discourse Grammar (3) *Prereq: LIN 6501.* Recent developments in studying the relationships between sentence grammar and discourse. Subject and theme, relativization and subordination, pronoun and anaphora, transitivity, tense and aspect, information structure, and discourse basis for grammatical categories. Synthesis of topics into a systematic framework.

LIN 6571: Structure of Specific Language (3) *Prereq: introductory linguistics course.* Linguistic examination of Aymara, Cakchiquel, Eskimo, Armenian, Bulgarian, Polish, Turkish, Quechua, Sanskrit, Tamil, or another rarely taught language.

LIN 6642: Psychological Linguistics(3) Scientific study of language as expressive behavior. Detailed examination of experimental research on linguistic and paralinguistic correlates of personality.

LIN 6804: Semantics I(3) Truth conditional semantics as opposed to pragmatics. Basic notions in classical logic since logic is assumed in truth conditional semantics.

LIN 6905: Individual Study (1-3; max: 12)

LIN 6910: Supervised Research (1-5; max: 5) S/U.

LIN 6932: Special Topics (3; max: 27)

LIN 6940: Supervised Teaching (1-5; max: 5) S/U.

LIN 6971: Research for Master's Thesis (1-15) S/U.

LIN 7118: History of Linguistics (3) *Prereq: LIN 6323, 6501.* The history of accounting for language data as evidenced by grammar-writing from Panini to the twentieth century, with primary focus on the development of linguistic thought in Europe and America.

LIN 7885: Discourse Analysis and Pragmatics(3) *Prereq: LIN 6601.* Methods of discourse analysis research and face-to-face discourse and pragmatics.

LIN 7979: Advanced Research (1-12) Research for doctoral

students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
LIN 7980: Research for Doctoral Dissertation (1-15) S/U.

Service Courses for International Students

EAP 5835: Academic Spoken English I (4) *Prereq: for international graduate students, especially those who expect to become teaching assistants. No credit toward any graduate degree.* Intensive training in English, particularly English used in formal speaking and pedagogy. S/U.
EAP 5836: Academic Spoken English II (2-3) *Prereq: EAP 5835 or qualifying SPEAK score. Required for international graduate students who are teaching but have not satisfied Graduate School requirements for oral English communication. No credit toward any graduate degree.* TAs are videotaped biweekly in their classrooms. Weekly instruction addresses language, cultural, and pedagogical problems encountered in the classroom. S/U.
EAP 5837: Academic Spoken English Tutorial (3) *Prereq: EAP 5835 or qualifying SPEAK score. Designed for international graduate students. No credit toward any graduate degree.* Language and interpersonal communication skills needed for one-on-one exchanges. International students are matched with undergraduates seeking tutoring in the graduate student's area of expertise. Tutoring sessions are videotaped and analyzed. S/U.
EAP 5845: Academic Writing (3) *Prereq: for international students. No credit toward any graduate degree.* Organizational strategies and formats for writing graduate-level papers, theses, and dissertations. Emphasizes writing in the student's discipline. Offered fall and spring terms. S/U.
EAP 5846: Research and Technical Writing (3; max: 12) *Prereq: for international and U.S. students. No credit toward any graduate degree.* The overall process of research writing, with assignments geared to the students' professional careers. S/U.
EAP 5937: Special Topics in Academic Spoken English (2) *Prereq: designed for international graduate students. No credit toward any graduate degree.* Overview of advanced oral English skills practiced intensively in other ASE courses for international students. Academic presentations and discussions, interpersonal communication strategies, cross-cultural issues, and accent modification. S/U.

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Management

Warrington College of Business Administration

Graduate Faculty

Chair: R. W. Emerson. *Graduate Coordinator:* J. A. Colquitt.
Complete faculty listing by department: Follow this link

The Management Department offers graduate work leading to a Ph.D. degree with a major in business administration and a concentration in management. In addition, the department offers courses in a Master of Science program with a major in management and A Master of Art program with a major in International Business (detailed under *Business Administration--General*).

Doctor of Philosophy––The Ph.D. program in business administration in the Department of Management prepares students for careers as faculty members of universities that emphasize teaching and research. The program is designed so that the student will (1) develop strong competence in the base discipline crucial to the study of organizations and organization processes and (2) follow a field of specialization in organizational behavior, organizational theory, human resource management, and strategic studies.

Admission requirements for the Ph.D. include (a) a minimum grade point average of 3.0, (b) an acceptable score on the GRE, and (c) for nonnative speakers of English, a satisfactory score on one of the following: TOEFL (Test of English as a Foreign Language: computer=213, paper=550, web=80), IELTS (International English Language Testing System: 6), MELAB (Michigan English Language Assessment Battery: 77), or successful completion of the UF English

Language Institute program.

The research interests of the faculty are quite broad. For example, work is being done on defining the domain of performance in organizations, employee selection, performance appraisal, goal setting and incentives, aging, dispositions and job satisfaction, corporate governance, health care, innovation processes, organizational control and executive compensation practices, agency theory, and organizational processes. Faculty often work on interdisciplinary projects with other departments.

In addition, the student has exposure to scholars and faculty members from other universities, and from other departments in the University, who are invited to give workshops in the Department.

Breadth Requirement––All students pursuing the Ph.D. are expected to be well versed in the structure and functioning of business organizations and the environment within which they operate. This requirement may be met through undergraduate or master's level work in business administration. The student who does not meet the breadth requirement before entering the Ph.D. program must take at least three graduate courses in different functional areas in the Warrington College of Business Administration but outside the Department of Management. These courses should complement the major area of study selected by the student.

Research Skills Requirement––The general nature of the research requirement has been specified by the Graduate Committee of the Warrington College of Business. Students must take six approved courses to satisfy it. For the typical student in the Department of Management, the research foundation courses include at least 18 credits in courses such as philosophy of social science (e.g., PHI 5425 or PHI 5405), basic statistical methods (e.g., STA 6126/6127), research methods (e.g., MAR 7786, EDF 7486, or PPE 6308), psychometrics (e.g., EDF 6436, EDF 7439), multivariate analysis (EDF 7932), experimental design (MAR 7622), field research methods (POS 6757), and qualitative research (EDF 6475, SYA 6315). The specific program is determined by the student's supervisory committee and will be tailored to fit the student's prior preparation and the specialization that the student chooses.

Major Course Requirements––The program of study for each student will include required seminars in Organizational Behavior, Organizational Theory, Strategic Management, and Human Resource Management Research, and the Management Workshop.

Specialization Requirements––Each student selects a specialization area. Courses must provide the depth of knowledge

required to teach and conduct research successfully in the area of specialization. This part of the program will be developed by the supervisory committee in conjunction with the student. The specialization courses are primarily offered within the Department of Management, although it is quite common for students to take courses in related disciplines, such as Marketing, Finance, Economics, Psychology, Statistics, and Decision and Information Systems.

Procedures for the qualifying examinations, dissertation, and final examination are given in the *Requirements for the Ph.D.* section of this catalog.

Combined Degree Program––The Department offers a bachelor's/master's program with the Department of Industrial and Systems Engineering. Contact the graduate coordinator for information.

BUL 5445: Ethical Role of the Manager(1) Meeting the responsibilities of being entrusted with resources to manage.
BUL 5810: Legal Environment of Business (3) American legal system, sources of law, adjudication, legal nature of corporation, major areas of state and federal corporate law, state and federal regulation of business, legal aspects of ethical and social responsibility of business; intellectual property, employment law, torts and contracts.
BUL 5811: Managers and Legal Environment of Business (2) *Designed for M.B.A. students.* Law governing relationships with corporation and between corporation and social, political, and ethical environment. Business and the Constitution, litigation and dispute resolution, agency and forms of business organization, state and federal regulation of corporations and securities.
BUL 5831: Commercial Law (3) *Prereq: BUL 4310.Primarily for students in M.Acc. program.* Contracts for sale of goods and services, documents of title, secured transactions, negotiable instruments, commercial paper, payment systems, bankruptcy, and related subjects. Emphasis on Uniform Commercial Code, federal bankruptcy act, and other federal and uniform state laws.
BUL 5832: Commercial Law for Accountants(2) *Prereq: level 5––M.Acc.* Legal ramifications of business transactions. Basic transactional areas to be studied include contracts, sales, and secured transactions. Brief review of accountants' legal liability.
BUL 6440: Business Ethics and Corporation Social Responsibility (3) Practical issues of managers in addressing ethical and moral problems; emphasis on critical thinking skills and developing an analytical framework for thinking about business ethical problems.
BUL 6441: Business Ethics and Corporate Social Responsibility (2) *Designed for advanced master's students in business administration.* Ethical issues managers face in business organizations.

BUL 6516: Law of Real Estate Transactions(2) Introduction to legal aspects, including basic concepts or real estate law, landlord-tenant relations, commercial leasing, multi-unit real estate interests, real estate finance, and sale of real estate. Analysis of legal aspects of real estate development, including impact of zoning and environmental laws, land improvement, and real estate syndication.
BUL 6652: Law and Ethics of Corporate Governance (3) *Prereq: BUL 5810 or 5811.* Law and ethics underlying and governing the structure and operation of business corporations in the U.S. and other industrial countries.
BUL 6821: Cyberlaw and Ethics (2) Critical legal and ethical underpinnings of electronic commerce and electronic business on the internet. Governmental approach to content control; commercial and personal information rights; access; jurisdiction; digital property; national and international issues in securities law, antitrust, fraud, financial crime, negligence, and encryption areas.
BUL 6841: Employment Law (2) *Designed for master's students in business.* Law related to employment and employees in business organizations.
BUL 6851: International Business Law (3) *Designed for M.B.A. students.* Legal aspects of managing the international business environment.
BUL 6852: International Business Law (2) *Designed for M.B.A. students.* Legal aspects of managing the international business environment.
BUL 6891: Legal Aspects of Technology Management (2) *Designed primarily for advanced master's students in business administration.>* Legal aspects of managing and trading technology, especially law that governs development, protection, and transfer of firm's intellectual assets. Topics include patents, copyrights, trademarks, trade secrets, and other forms of intellectual property with applications to high technology and internet.
BUL 6905: Individual Work (1-5; max: 10) *Prereq: consent of instructor.* Reading and/or research in business law.
BUL 6930: Special Topics (1-3; max: 9) *Prereq: consent of instructor.* Topics not offered in other courses and of special current significance.
ENT 6706: Global Entrepreneurship (2) Consideration of global market context in starting entrepreneurial ventures internationally.
MAN 5149: Leadership Skills (1) *Coreq: master's students in business administration.* Concepts of leadership theory and methods to improve skills.
MAN 5245: Organizational Behavior (3) *Prereq: designed for M.B.A. students.* Relationships among the individual administrator and supervisors, the employees supervised, and associates at a comparable level in the organization.
MAN 5246: Organizational Behavior (2) *Designed for M.B.A. students.* Behavior of individuals, groups, and organizations. Understanding organizations, how they work, and the people in them. Concepts presented in relation to core managerial competencies.

MAN 5265: Managing Groups and Teams (1) *Designed for master's students in business.* Development of critical team skills and techniques to improve team processes and effectiveness. S/U option.

MAN 6107: Motivation in Organizational Setting (3) *Prereq: MAN 5245 or consent of instructor.* Theory and research on motivational processes relevant to, and applied to, individual human behavior in complex organizations.

MAN 6128: Management Skills and Personal Development(3) Explores the interpersonal skills needed to develop effective managers.

MAN 6149: Developing Leadership Skills (2) *Designed for master's students in business administration.* Concepts of leadership theory and methods to improve skills.

MAN 6257: Power and Politics in Organizations (1-3; max: 3) *Prereq: consent of instructor. Designed for advanced master's students in business administration.* Links between theory and practice in the use of power and political skills in organizations.

MAN 6266: Managing Groups and Teams in Organizations (2) *Prereq: MAN 5246 or equivalent.* Composing, developing, and motivating teams. Inter- and intra-team processes. Assessing barriers to effectiveness. Interventions to overcome team problems.

MAN 6286: Managing Strategic Processes and Change in Organizations (2) *Prereq: MAN 5246 or equivalent.* Organizational and managerial issues. Strategic decision-making. Managing research and development as a strategic resource. Simulation and experimentation. Organizational change. Interactions among organizational strategy, structure, and culture.

MAN 6296: Designing Effective Organizations (2) *Prereq: MAN 5246 or equivalent.* The nature of the firm. History of organizational design. Contemporary designs for vertical integration, diversification, low cost, differentiation, and mixed strategies. Organizational design problems.

MAN 6321: Human Resource Management (3) *Prereq: consent of instructor.* Techniques for managing personnel functions such as recruitment, selection, performance evaluation, training, compensation, and labor relations.

MAN 6331: Compensation in Organizations (2) *Designed for M.B.A. students.* Relevant practical and theoretical information regarding design of reward systems that support organizational strategies.

MAN 6351: Training and Development in Organizations (2) *Designed for M.B.A. students.* Human resource management issues related to training and development. Methods for identifying training needs, developing content, conducting sessions, and evaluating effectiveness of programs according to organizational and individual objectives. Special topics such as developing management careers, identifying and developing management talent, and organizational change and development.

MAN 6365: Organizational Staffing (3) *Prereq: MAN 5245.* Overview of human resource selection. Recruitment, job analysis,

psychometrics, criterion measurement, development and evaluation of selection devices, and practical applications.

MAN 6366: Organizational Staffing (2) *Designed for M.B.A. students.* Personnel selection. Foundations of job analysis, measurement, and selection techniques. Psychometric principles, analyzing job requirements, and assessing relevant human characteristics. Assessing individual contributions to organizational effectiveness.

MAN 6385: Strategic Human Resource Management (2) *Prereq: MAN 5246 or equivalent.* Organizational human resource management. How organizations use human resources effectively to achieve organizational goals.

MAN 6446: Negotiations (3) *Prereq: designed for M.B.A. students.* Theory and skills of negotiation and conflict resolution.

MAN 6447: Art and Science of Negotiation (2) *Designed for advanced master's students in business administration.* Theory and processes of negotiation as practiced in variety of settings. Understanding behavior of individuals, groups, and organizations in competitive situations.

MAN 6537: Managing Technology in Organizations (2) *Prereq: MAN 5246 or equivalent.* Issues in developing, diffusing, and adopting new technologies. Interplay of technology, organizations, and work. Interplay of developing, transferring, and adopting new technologies. Research and development of new products and processes. Technology transfer. Diffusion of innovation.

MAN 6627: Cross Cultural Negotiation (2) Theory and processes of negotiation as practiced in multicultural environments. Fundamental elements of deal making and dispute resolution.

MAN 6635: International Aspects of Human Resource Management (2) *Designed for master's students in business administration.* Perspectives of a multinational firm.

MAN 6636: Global Strategic Management (2) *Designed for master's students in business administration.* Strategic issues facing global and multinational organizations.

MAN 6637: Global Strategic Management (3) *Prereq: designed for master's students in business administration.* Analyzes how firms compete in the multinational and global environment.

MAN 6721: Business Policy (3) *Prereq: all MBA required courses. Designed for M.B.A. students. Taken the last semester before graduation.* Integrating and applying the various functional and support areas of business administration. Business policy making and administration from the general manager's perspective.

MAN 6724: Strategic Management (2) *Designed for M.B.A. students and taken the last semester before graduation.* Complex strategic questions that confront general managers. Approaches learned in other courses combined with material particular to strategic management. Approaches used to formulate and implement overall strategies that allow firms to obtain and sustain competitive advantages while creating shareholder wealth.

MAN 6905: Individual Work in Management (1-5; max: 10) *Prereq: departmental approval.* Reading and/or research in

management.
MAN 6910: Supervised Research (1-5; max: 5) S/U.
MAN 6930: Special Topics (1-3; max: 12) *Prereq: consent of instructor/department.* Topics not offered in other courses and of special current significance.
MAN 6940: Supervised Teaching (1-5; max: 5) S/U.
MAN 6957: International Studies in Management (1-4; max: 12) *Prereq: admission to approved study abroad program, and departmental approval.* S/U.
MAN 6958: International Study Program (1-6; max: 6) *Designed for master's students in business administration.* Integrative experience in international business through onsite visits to major industries and related governmental and nongovernmental organizations.
MAN 6973: Project in Lieu of Thesis (1-4; max: 4)
MAN 7108: Seminar in Research Concepts and Methods in Management (1-3) *Prereq: consent of instructor.* Design, execution, and evaluation of research in organizational behavior, human resource management, strategic management, and organization theory.
MAN 7109: Seminar in Motivation and Attitudes (1-3) Various motivation theories, including expectancy and equity theories. Job satisfaction and other work attitudes, and their effects on individuals and organizations.
MAN 7146: Seminar in Leadership (1-3; max: 3) Theoretical and empirical work in leadership theory. Various theories including Ohio State studies, trait theory, LPC theory, path-goal theory, substitutes for leadership, and transformational/charismatic leadership theory.
MAN 7205: Organization Theory (3) *Prereq: consent of instructor.* Method and study of human behavior in organizational contexts. Organizational structure and environment.
MAN 7207: Seminar on Foundations of Organizational Theory (1-3) Classical models of organizations as coordination and control mechanisms. Organizational boundaries, political processes, and contingency theory.
MAN 7208: Seminar in Contemporary Approaches to Organizations (1-3) Recent organizational views such as population ecology, economic approaches to organizational design and control, organizations and technology, and network firms.
MAN 7267: Seminar on Groups and Teams Research (1-3) Emerging research on groups and teams in organizations. Classic and contemporary theories and research on team composition and team performance.
MAN 7275: Organizational Behavior (3) *Prereq: consent of instructor.* Individual and group behavior.
MAN 7328: Seminar on Staffing and Selection (1-3) Theory and methods that organizations use to staff their positions.
MAN 7778: Seminar in Strategic Adaptation to Environment (1-3) How organizations make decisions to cope effectively with their environments. Theory and research on how firms operate in

their environments, such as theories of the firm, resource and knowledge-based views of organizations, and various strategic choices.

MAN 7779: Strategic Processes and Structure in Organizations(1-3; max: not repeatable for credit) Theories and research on how organizations implement strategic choices, covering decision making, corporate governance and control, strategy/structure issues, compensation strategies, and strategic change.

MAN 7933: Seminar in Management (3; max: 9) *Prereq: consent of instructor.* Research topics and literature in strategic aspects of decision making.

MAN 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

MAN 7980: Research for Doctoral Dissertation (1-15) S/U.

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Marketing

Warrington College of Business Administration

Graduate Faculty

Chair: J. W. Alba. *Graduate Coordinator:* L. A. Brenner. *Complete faculty listing by department*: Follow this link

The Marketing Department offers graduate work leading to the Ph.D. degree in business administration, the M.S. degree in business administration with a concentration in either retailing or research, and a concentration in the Master of Business Administration (M.B.A.) program. Requirements for the M.B.A., M.S., and Ph.D. degrees are described in the *General Information* section of this catalog.

Doctor of Philosophy: The Ph.D. program admission standards are the following: (a) acceptable scores on the Graduate Record Examination (typically 1250 or higher) or a score of 600 on the Graduate Management Admission Test; (b) for nonnative speakers of English, a satisfactory score on one of the following: TOEFL (Test of English as a Foreign Language: computer=213, paper=550, web=80), IELTS (International English Language Testing System: 6), MELAB (Michigan English Language Assessment Battery: 77), or successful completion of the UF English Language Institute program, and (c) a record of previous scholastic excellence in either business or a closely related social science discipline (e.g., economics, psychology, sociology, statistics). Neither industry experience nor an M.B.A. degree is required.

The program offers the opportunity for concentrated study in consumer behavior, marketing management, and quantitative

modeling of marketplace phenomena.

The Ph.D. curriculum consists of course work in three areas: research foundations, the major field, and electives. In addition, students are required to complete a first-year summer research project and a third-year review paper. Other requirements are outlined in the *General Information* section of this catalog.

The research foundations requirement comprises a set of five to six courses chosen from statistics and/or economics.

The major field course work is made up of a set of five required marketing seminars that are completed during the student's first 2 years in the program. In addition, the student is required to attend MAR 7925 Workshop in Marketing Research, which features presentations by both University of Florida faculty and students and researchers from other institutions. Electives are selected from both advanced marketing seminars and other related disciplines to complement the student's research program. There is no formal minor requirement.

Master of Science: The M.S. degree in business administration with a concentration in retailing is Internet delivered. Applicants must have (a) an undergraduate degree from a regionally accredited program, (b) a minimum 3.0 undergraduate GPA, (c) a minimum 460 GMAT (1000 GRE), and (d) a minimum of 3 years of full-time professional work experience. The concentration requires 21 credits of core business courses, 3 credits of business skills courses, 6 credits of retailing electives, and 3 credits of project in lieu of thesis.

The M.S. degree in business administration with a concentration in marketing is intended for students whose ultimate objective is to earn a Ph.D. in marketing at another institution. Applicants must have (a) an undergraduate degree from a nationally accredited program, (b) a minimum 3.5 undergraduate GPA, (c) a minimum 600 GMAT (1250 GRE), and (d) evidence of a strong interest in academic research in marketing. The concentration requires 30 credits of graduate-level courses, at least half of which must be in marketing.

MAR 5805: Problems and Methods in Marketing Management (3) *Prereq: ACG 5065, QMB 5303. Designed for MBA students.* Concepts and techniques for resolving marketing management problems through the case method.
MAR 5806: Problems and Methods in Marketing Management (2) *Prereq: ACG 5065, QMB 5305.* Concepts and techniques for resolving marketing management problems through case method.
MAR 6157: International Marketing (2) *Designed for M.B.A. students.* Analysis and strategies for international environment.
MAR 6158: International Marketing (3) *Prereq: MAR 5805.*

Designed for M.B.A. students. Analysis and strategies for marketing in the international environment.

MAR 6202: Marketing Channel Management (2) Elements and management of marketing distribution channels. An inter-organizational system for making goods, services, and concepts available to businesses and/or consumers and enhancing their time, place, and possession utilities.

MAR 6335: Building and Managing Brand Equity (2) *Prereq: QMB 5304, QMB 5305, MAR 5805.* Product and brand management decisions needed to build, measure, and manage branded equity. Focal objectives are to increase understanding of important issues in planning and evaluating brand strategies and to provide the appropriate theories, models, and other tools to make better branding decisions.

MAR 6457: Business-to-Business Marketing (2) *Prereq: MAR 5805.* Strategy concepts for marketing products and services to other businesses; institutions such as hospitals and universities, and government. Role of marketing strategy as part of overall business strategy. Developing and launching new products, managing channels of distribution and sales forces, and building and maintaining alliances and partnerships.

MAR 6508: Customer Analysis (2) *Prereq: MAR 5806. Designed for M.B.A. students.* Theory and research in the behavioral and social sciences applied to individual and aggregate behavior of consumers.

MAR 6646: Marketing Research for Managerial Decision Making (3) *Prereq: MAR 5805 and QMB 5303. Designed for M.B.A. students.* Examination of approaches and methods of marketing research with particular attention given to the perspective of the marketing manager.

MAR 6648: Marketing Research for Managerial Decision Making (2) *Prereq: MAR 5806 and QMB 5305. Designed for M.B.A. students.* Examination of approaches and methods with particular attention given to the perspective of the marketing manager.

MAR 6725: Introduction to Electronic Commerce (3)

MAR 6816: Advanced Marketing Management (MBA) (3) *Prereq: MAR 5805. Designed for M.B.A. students.* Advanced case course dealing with the wide range of strategic problems faced by the marketing manager.

MAR 6818: Advanced Marketing Management (2) *Prereq: MAR 5806.* Advanced cases dealing with the wide range of strategic problems faced by the marketing manager.

MAR 6833: Product Development and Management (2) *Designed for M.B.A. students.* Management of new product development process including identifying new product opportunities, product concept testing, market feasibility analysis, prototype development, market testing, and commercialization.

MAR 6834: Marketing of Science and Technology (2) *Prereq: MAR 5806 or consent of instructor.* Applying special marketing techniques and strategies to discoveries, inventions, and innovations embodied in products, services, and intellectual property.

Emphasizes the particular characteristics of engineering- and science-driven market offerings.

MAR 6835: Marketing of Science and Technology (3) *Prereq: MAR 5805.* Applying specialized marketing techniques and strategies to discoveries, inventions, and innovations embodied in products, services, and intellectual property. Focuses on particular characteristics of engineering- and science-driven market offerings.

MAR 6837: Consumer-Centered Product Design(3) Project-based. Elaboration on product-development model introduced in core marketing course. Focus on intersection of marketing, engineering, and design.

MAR 6861: Customer Relationship Management(2) *Prereq: MAR 5806.* Conceptual foundations, analytical techniques and marketing tactics for managing customer relationships.

MAR 6862: Customer Relationship Management (3) Acquiring, building, and maintaining mutually beneficial relationships with customers. The customer as a financial asset that companies should measure, manage, and maximize like other assets.

MAR 6905: Individual Work (1-4; max: 8) *Prereq: departmental approval.* Reading and/or research.

MAR 6910: Supervised Research (1-5; max: 5) S/U.

MAR 6930: Special Topics in Marketing (1-4; max: 16) *Prereq: consent of instructor.* Selected topics in marketing management, research, or theory.

MAR 6940: Supervised Teaching (1-5; max: 5) S/U.

MAR 6957: International Studies in Marketing (1-4; max: 12) *Prereq: admission to approved study abroad program and departmental approval.* S/U.

MAR 6971: Research for Master's Thesis (1-15) S/U.

MAR 6973: Project in Lieu of Thesis(3) S/U.

MAR 7507: Perspectives on Consumer Behavior (3) *Prereq: graduate standing or consent of instructor.* In-depth analysis of the field. Critically examines various theoretical and methodological approaches through marketing and consumer behavior literatures. Students must develop an original research project.

MAR 7576: Consumer Preference Formation and Change (3) *Prereq: MAR 7507 or consent of instructor.* Individual and social influences on attitude formation, change, and resulting behavior. Attitudes as evaluative responses to interplay of motivational and informational influences. Conceptual framework for analysis of nature and origin of value in consumer judgments.

MAR 7588: Consumer Information Processing and Decision Making (3) *Prereq: MAR 7507 or consent of instructor.* In-depth treatment of consumer information processing and choice behavior as a function of psychological and environmental factors. Underlying concepts and theories of individual judgment and decision making; critical evaluation of research in this area.

MAR 7589: Judgment and Decision Making(3) *Prereq: consent of instructor.* Literature review related to psychology of judgment and decision making. Discussion of normative and descriptive theories of decision making and empirical evidence that speaks to

those theories.

MAR 7622: Design of Marketing Research (3) *Prereq: consent of instructor.* Design, execution, analysis, and interpretation of experiments in marketing.

MAR 7626: Multivariate Statistical Methods in Marketing (3) Review of application of multivariate methods including multiple regression; factor discriminant and cluster analysis; and conjoint measurement to summarize and analyze marketing data.

MAR 7636: Research Methods in Marketing (3) *Prereq: admission to M.A. or Ph.D. in marketing or consent of instructor.* Experimental and quasi-experimental design; procedures for laboratory and field experiments; statistical conclusion, internal, external, and construct validity in research design; reliability and validity in measurement; creativity in hypothesis generation and theory testing in behavior research.

MAR 7666: Marketing Decision Models (3) *Prereq: ECO 7408 and departmental approval.* Development and implementation of model-based approaches to marketing decision making. Model-based analysis of advertising, pricing, promotion, distribution. Research project.

MAR 7667: Building Mathematical Models in Marketing (3) Various issues and approaches for building and analyzing mathematical models of marketing phenomena and related decision problem.

MAR 7786: Marketing Literature (3) *Prereq: admission to M.A. or Ph.D. in marketing or consent of instructor.* Survey of academic marketing literature, with special focus on conceptual and empirical studies of marketing strategy and marketing program variables.

MAR 7925: Workshop in Marketing Research (3; max: 9) *Prereq: consent of department.* In-depth analysis of current research topics. Emphasis on research programs of leading scholars. Students critically appraise the rationale, strengths, and weaknesses of each study.

MAR 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

MAR 7980: Research for Doctoral Dissertation (1-15) S/U.

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Mass Communication

College of Journalism and Communications

Graduate Faculty

Dean: J. Wright. *Graduate Coordinators:* (Advertising) J. R. Goodman; (International Communication) M. Leslie; (Journalism) C. Armstrong; (Mass Communication Law) C. Calvert; (Political Communication) L. L. Kaid; (Public Relations) J. C. Molleda; (Science/Health Communication) D. Treise; (Telecommunication) J. Cleary. *Complete faculty listing by department*: Follow this link

Through the Division of Graduate Studies and Research, the College of Journalism and Communications offers the Doctor of Philosophy degree, the Master of Arts in Mass Communication (thesis, nonthesis, or project option) degree, and the Master of Advertising (thesis) degree. Requirements for these degrees are given in the *General Information* section of this catalog.

Doctoral students work closely with faculty members in research leading to a dissertation embodying a humanities, law/policy, or social sciences approach. Emphases within these approaches for which faculty members have expertise include advertising, journalism, public relations, telecommunication, international communication, and political communication. Details of doctoral faculty research interests and other aspects of the program are given in the College's Ph.D. Handbook.

Master's students may complete a thesis in advertising, journalism, public relations, telecommunications, international communication, political communication, or science/health communication. Nonthesis students choose from journalism, political campaigning, public

relations, and telecommunication. With the approval of the Associate Dean of Graduate Studies and other faculty members, master's students may develop an individualized program of study, with thesis, to meet their specific needs and interests. A project in lieu of thesis option is available for some specializations, including documentary.

Mass Communication/Law joint degree programs: Programs leading to the Master of Arts in Mass Communication or the Doctor of Philosophy and the Juris Doctor are offered under the joint auspices of the College of Journalism and Communications and the College of Law. For students interested in scholarship or practice of communication law or in reporting on the law, the programs offer the opportunity to blend relevant work from the two colleges. Students must meet the entrance requirements of both colleges. A thesis or dissertation is required. Interested students should apply for admission to both the Graduate School and the College of Law, noting on the applications the joint nature of the admission requests. Further information on the programs and on application procedures is available from the Holland Law Center and from the Division of Graduate Studies and Research of the College of Journalism and Communications.

General admission: Admission is granted to applicants with and without background in mass communication. Students without academic preparation in mass communication or appropriate experience may be required to take articulation work. These courses are taken concurrently with general graduate courses, starting in the first term of registration. Some degree plans require a background course in statistics. Students who have satisfied that requirement must provide written verification. Including articulation courses, the master's degree normally can be earned in one and one-half or two years of full-time study. Doctoral studies require three or more years of full-time study and research. Students who may require articulation courses should contact the Associate Dean of Graduate Studies.

Grading policy: Any student who

receives one grade below B- will be placed on probation, with the exception of

courses taken from the Levin College of Law. For these courses, any student receiving one grade below C in any course from the Levin College of Law will be placed on probation. A requirement of the probation is that the

student must achieve or maintain a cumulative grade point average of 3.0 or higher at the end of the next academic term in residence. A student who fails to satisfy the requirement will be suspended. A student who accumulates two grades below "B-" during graduate

studies will be suspended, as will a student who receives one grade of "D+" or lower at any time. Students will be allowed only one suspension.

Combined degree program: The College offers a combined bachelor's/master's program. For information, contact the Associate Dean for Graduate Studies. For additional information, please consult http://www.jou.ufl.edu/grad.

ADV 5005: Advertising Planning (3) Introduction to the process of developing advertising strategy, emphasizing theory and research methods.
ADV 6006: Theories of Advertising(3) Theories dealing with consumer responses to marketing communications: state-of-the-art advertising and marketing communications theory, academic articles examining consumer responses.
ADV 6305: Advanced Media Planning (3) *Prereq: ADV 4300, MMC 6421, or equivalents.* Media planning to meet advertising goals. Use of research findings. Computer models.
ADV 6403: International Advertising(3) Global competition and worldwide markets; technological revolutions; and branding products and services under different cultural, regulatory, and competitive conditions.
ADV 6503: Advertising Creative Strategy and Research (3) *Coreq: MMC 6421 or equivalent.* Social science findings as guides for decisions. Use of consumer behavior concepts in shaping advertising message content and improving media selection.
ADV 6505: Advertising Research Methods(3) Introduction to methods most commonly use in professional and scholarly research, including secondary, qualitative, survey, content analysis, and experimental methods.
ADV 6602: Advertising Management (3) *Prereq: ADV 6305 and 6503, or consent of instructor.* Application of management principles and practice to effective development of advertising/public relations plans. Case studies and discussion of current problems in research, planning, operations, administration, and evaluation.
COM 6315: Advanced Research Methods (3; max: 6) *Prereq: MMC 6421 and STA 6126 or equivalents, and consent of instructor.* Scientific method, measurement, analysis. Student research required.
COM 6940: Supervised Teaching (1-3; max: 5) S/U.
FIL 6061: History of Documentary Film I (3) History of development from its roots in nineteenth-century art forms to its role in World War II. Styles and techniques of documentary. Contribution as persuasive means of communication to achieve social and political goals.
FIL 6062: History of Documentary Film II (3) History of development from end of World War II to present. Styles and techniques of documentary. Contribution as persuasive means of

communication to achieve social and political goals.

FIL 6101: Advanced Radio, Television, and Film Writing (3) *Prereq: consent of instructor.* Forms, techniques, and types of writing as they apply to radio, television, and film.

FIL 6315: Writing for Documentary I(3) Elements of good documentary topic, role of drama in documentary writing, structure in documentary writing, story development in documentary, interviewing for documentary, basic tools of documentary writing, and law and ethics in documentary.

FIL 6317: Producing and Writing the Documentary (3) Fundamentals of producing, directing, and writing; and the business and aesthetic dimensions of documentary.

FIL 6335: Business of Documentary (1) Nonproduction aspects of documentary: fund raising, promotion, distribution, and film festivals.

FIL 6340: Issues and Problems in Documentary (3) Ethical and legal issues in documentary filmmaking.

FIL 6365: Documentary Pre-Production Planning (3) *Prereq: consent of instructor.* Conceptualizing and developing television documentary. Components include the idea, funding, planning production, and producing the preview tape, and writing and presenting a proposal.

FIL 6366: Documentary Procedures II (3) Theoretical, aesthetic, and technical principles of nonlinear editing for documentary.

FIL 6377: Documentary Field Production (3) Basics of producing, shooting, lighting, sound gathering, and editing. Technical and creative aspects.

FIL 6378: Documentary Research Methods (3) Research process preceding the production of television documentary and the skills needed to construct an effective research strategy.

FIL 6380: Advanced Post-Production Techniques (2) Advanced technical, theoretical, and aesthetic principles of post-production process used in editing television documentaries. Emphasizes developing continuity, building sequences, refining dramatic structure, narrators, and special effects.

JOU 5007: History of Journalism (3) Origin, development, and potentiality of print and broadcast media. Evolution of standards, policies, methods, and controls.

JOU 5705: Issues and the Press (3) Influence of the press in defining and shaping public concern with major social issues.

JOU 6102: Advanced Reporting Workshop (3) *Prereq: MMC 5206 or equivalent, or consent of instructor.* Depth reporting theory and practice.

JOU 6309: Seminar in Journalism as Literature (3) Analysis of mass media writing, broadcast programs, and graphics to assess their merits both as journalism and as art. Various periods studied; emphasis on 20th century.

JOU 6502: Newsroom Management (3) Internal problems of newspaper operation. Status of personnel, effects of technological developments, news decision-making, defining objectivity, improving news coverage.

MMC 5005: Mass Communication History (3) Origin, development, and potentiality of print and electronic media. Evolution of standards, policies, methods, controls.
MMC 5015: Electronic Publishing (3) Services and technology of major forms of electronic publishing and videotex. Nature and economics of information. Impact of new mass communication technologies.
MMC 5206: Advanced Law of Mass Communication (3) Problems of constitutional law, libel, privacy, and governmental regulation. Not open to students who have taken MMC 4200 or equivalent.
MMC 5306: International Communication (3) Analysis and comparison of print and electronic communication systems among nations and cultures; barriers and stimuli to international communications; mass media in national development.
MMC 5315: Survey of Foreign Correspondence (3) Nature and history of foreign correspondence. Impact on nations and international relations.
MMC 5708: Foundations of Intercultural Communication (3-4; max: 4) Theory and practice of intercultural communication.
MMC 6202: Legal Problems of Mass Communication (3) *Prereq: MMC 5206 or previous research or equivalent.* Constitutional interpretation, conflicts between media and rights of others, regulation, the nature of jurisprudence.
MMC 6307: Seminar in International Communication (4; max: 8) *Prereq: MMC 5306 or equivalent, and consent of instructor.* Specialized or regional aspects of international communication; in-depth investigation of particular concepts and research literature. Student research required.
MMC 6400: Mass Communication Theory (3) Structure, content, process, effects of communication; contributions of other disciplines; barriers to effective communication; use of research concepts.
MMC 6402: Seminar in Mass Communication Theory (4; max: 16) *Prereq: MMC 6400, 6421, or equivalents, statistics, and consent of instructor.* Specialized aspects of mass communication theory; in-depth investigation of particular concepts and research literature. Student research required.
MMC 6405: Seminar in Mass Communication and Public Opinion (4) *Prereq: MMC 6400, 6421 or equivalents, and consent of instructor.* Conceptualizations of public opinion as a collective process. The role of mass communication in describing and shaping perceptions of public opinion. Student research required.
MMC 6409: Science / Health Communication (3) Overview of the field of mass communication. Nexus of scientists, journalists, public information officers and audiences. Topics include science literacy, framing of science, issues, public involvement, and the impact of science communication on policy.
MMC 6417: Seminar in Mass Media and Health(4) Mass communication and health communication theories examined as they related to intended and unintended effects on individual behavior and on public health policy. Focus on effects *other* than

those associated with mass mediated public health campaigns.

MMC 6421: Research Methods in Mass Communication (3) Introduction to experiments, surveys, content analysis, sampling, measurement. Laboratory applications.

MMC 6423: Content-Analysis Methods(3) Sampling, category construction, calculation of intercoder reliability, and analysis of data. Evaluation of content analysis methods and opportunity to undertake project using this methodology. Focus on analysis of mass media messages, but includes content analysis of other communication content.

MMC 6426: Seminar in Qualitative Research (4) Theory and application in social science and communication. Qualitative data analysis, evaluation, ethical considerations, and writing.

MMC 6428: Collaborative Communication Research(4; max: 8) Experience in conducting team research. Student-faculty teams select and work through projects with intent to produce scholarly work for conference presentation, publication, or research grant proposal.

MMC 6560: Seminar in History of Mass Communication (4; max: 8) *Prereq: JOU 5007, MMC 5005, or equivalent, and consent of instructor.* Reading, critical study. Advanced investigative report on an approved research subject.

MMC 6612: New Media and a Democratic Society(3) Relationships among new media, citizens, and governments; effects of Internet on democracy and globalization; role of journalism in democratic society.

MMC 6615: Race, Class, Gender, and Media(3-4; max: not repeatable for credit.) Examination of race, class, and gender portrayals in media, from critical and cultural studies perspectives.

MMC 6618: Survey of Political Communication(3) Role of communication in political process, including study of news coverage of political events, political advertising, political debates, international political communication, and politics and new technologies.

MMC 6619: Seminar in Political Advertising(3) Role of advertising in politics. Political advertising theories, research on negative advertising, political advertising and women candidates, international political advertising, and news media coverage of political advertising.

MMC 6660: Mass Communication and Society (3) Rights, responsibilities, ethics of communication media; government and media; economic, political, and social determinants of media content.

MMC 6665: Seminar in First Amendment Theory(4) *Prereq: MMC 5206L or equivalent, and consent of instructor.* Investigation into meaning and purpose of press, speech, petition, and assembly clauses of First Amendment. Offered in fall semester, even-numbered years.

MMC 6666: Seminar in Research in Mass Communication Law (4) *Prereq: MMC 5206 or equivalent, and consent of instructor.* Investigation of legal research techniques for the mass

communication scholar and of literature of a particular mass media law topic. Offered in fall semester, odd-numbered years.

MMC 6667: Seminar in Advanced Topics in Mass Communication Law (4) *Prereq: MMC 6666 or LAW 5792 or equivalent, and consent of instructor.* Execution of individual or group research project on specialized topic under close supervision of instructor. Offered in spring semester, even-numbered years.

MMC 6668: Seminar in Public Policy Toward Mass Media (4) *Prereq: MMC 5206 and RTV 5702 or equivalents, and consent of instructor.* Examination and application of major theoretical perspectives of public policy-making as they apply to the American mass media.

MMC 6905: Individual Work (1-3; max: 9) Reading or research.

MMC 6910: Supervised Research (1-3; max: 5) S/U.

MMC 6920: Communication Proseminar (1) *Required at beginning of each student in the law track.* Introduction to mass communication and graduate study. S/U.

MMC 6929: Communication Colloquium (1; max: 8) Provides common grounding in subjects across the students' research approaches. Students enroll in the one-credit course fall and spring semester during the first year. After the first year, students are welcome and encouraged to attend, but registration is not required. S/U.

MMC 6930: Seminar in Mass Communication Teaching (3) Research and training for teaching and supervision of student mass media.

MMC 6936: Special Topics in Mass Communication (1-3; max: 6) *Prereq: consent of instructor or graduate adviser.*

MMC 6949: Professional Internship (1-3; max: 3) Training in an approved mass communication office; instructor receives reports from on-site supervisor. S/U.

MMC 6971: Research for Master's Thesis (1-15) *Prereq: consent of instructor.* S/U.

MMC 6973: Project in Lieu of Thesis (1-9) *Prereq: consent of instructor.* Developing, testing, and evaluating an original mass communication project. S/U.

MMC 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

MMC 7980: Research for Doctoral Dissertation (1-12) S/U.

PUR 6005: Theories of Public Relations (3) Theories that dominate the field. Evolution of theories, their critiques, and current standing.

PUR 6006: Public Relations Foundations (3) Roles and responsibilities of public relations professionals and the function of public relations in institutions and society.

PUR 6416: Public Relations and Fund Raising (3) Applying public relations theories and concepts to the practice-centered study of fundraising in nonprofit organizations. Principles and processes of

building relationships with donors and of designing and implementing programs in annual giving.

PUR 6446: Public Relations and Philanthropy (3) Applying public relations theories and concepts to the practice-centered study of philanthropy, organizations, and the role of each in society. Effective strategies for managing relationships between philanthropic organizations and stakeholders.

PUR 6506: Public Relations Research(3) Applied research methods for strategic management of public relations. Emphasis on using formative research for planning and implementing programs/campaigns and evaluative research for measuring effectiveness.

PUR 6607: Public Relations Management(3) Application of strategic management to development of public relations plans and programs. Emphasis on theoretical framework for relationship management in public relations.

PUR 6608: International Public Relations (3) Factors to assist conceptualization and execution of international public relations activities. Explores the relationship between environmental variables and international public relations practices. Review of empirical evidence about public relations practices in other countries and methodological issues pertaining to conducting research.

PUR 6934: Problems in Public Relations (3) Special topics, case studies, community relations, and theory-based analysis of public relations problems.

RTV 5702: Telecommunication Regulation (3) *Prereq: undergraduate or graduate law course, or consent of instructor.* The legal structure of radio, television, cable, satellite, and new media forms; the Communication Act, and the Federal Communications Commission.

RTV 6508: Audience Analysis (3) Methods of audience analysis. Survey research, sampling, and program content analysis. Analysis of secondary audience data.

RTV 6801: Telecommunication Management (3) Management principles of the telecommunications industry, with practical and theoretical application for television, radio, film, online, and other electronic media sectors.

RTV 6807: Telecommunication Outlet Systems and Practices (3) Structural and procedural elements of broadcast stations, cable systems, and other local radio-television facilities. Review of research and models in telecommunications administration, economic planning and control, merchandising and positioning, sales and advertising.

RTV 6973: Project in Lieu of Thesis (1-9) *Prereq: consent of instructor.* Development, testing, and evaluation of an original electronic media product, audience research, or management analysis. S/U.

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur,

Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Materials Science and Engineering

College of Engineering

Graduate Faculty

Chair: K. S. Jones. *Graduate Coordinator:* J. J. Mecholsky, Jr.
Complete faculty listing by department: Follow this link

The Department of Materials Science and Engineering offers the Master of Science, Master of Engineering, Doctor of Philosophy, and the Engineer degrees. Requirements for these degrees are described in the General Information section of this catalog. Degrees may be obtained with specialization in biomaterials, ceramics, composites, computational materials science, electronic materials, metals, and polymers.

Nontraditional Degree Programs: The Department offers a combined bachelor/master's degree program. The combined bachelor/master's program allows qualified students to earn both degrees in materials science and engineering with savings of a tangible number of credit hours. Qualified students are allowed to begin master's (M.S. or M.E.) course work in their junior years and double count specific graduate courses for both degrees. The master's degree may be completed within 2 to 3 semesters after completing the bachelor's degree. Program admission requirements are (1) satisfaction of Graduate School admission requirements, (2) an upper division GPA of at least 3.5, (3) completion of a minimum of 18 credit hours of courses in materials science and engineering, (4) admission by the Department's Graduate Admission Committee and approval by the College of Engineering and the Graduate School. For more information, contact the Department.

The J.D./M.S. (thesis/nonthesis) is a joint degree program culminating in both the Juris Doctor degree, awarded by the College of Law, and the Master of Science (thesis/nonthesis), awarded by the College of Engineering. Under this program, a student can earn both degrees in approximately 1 year less than it would take to attain both degrees if pursued consecutively.

The Department also offers combined BS/MS materials science and engineering/biomedical engineering master's degrees. The program requirements are similar to those in materials science and engineering. For more information, please contact both Departments.

Concurrent M.D./Ph.D. degrees are offered through a collaborative program between the College of Medicine and Materials Science and Engineering. For more information, please contact the Department.

Specific areas of specialization within the Department include biomaterials, ceramics, composites, computational materials, corrosion, diffusion, electronic materials, glasses, mechanical behavior, quantitative microscopy, mineral processing, nanotechnologies, reaction kinetics in the solid state, structural analysis, composites, compound semiconductors, opto-electronic materials, integrated circuit materials, and high temperature superconductors.

To be eligible for regular admission to the graduate program within the Department, the student must hold a B.S. in an appropriate major. Because of the breadth of M.S.E. graduate programs, students with degrees in materials, ceramics, metallurgy, other engineering, mathematics, or science areas (such as biology, chemistry, or physics) have found ample opportunities to pursue their research and training areas of interest.

The faculties of the Department of Materials Science and Engineering (MSE) of the University of Florida (UF) and the University of Roma Tor Vergata (URTV) have approved a cooperative degree program in Materials Science and Engineering culminating in a Doctor of Philosophy degree, awarded by both universities. Contact the Department for details.

EMA 5008: Particle Science and Technology: Theory and Practice (3) *Prereq: PHY 2049/2049L or equivalent and CHM 2046/2046L or equivalent.* Introduction to field by surveying theoretical and practical aspects. Particulate preparation, particle characterization, surface modifications, particulate systems, and technological applications.
EMA 5108: Vacuum Science and Technology (3) *Prereq: CHM 2045, PHY 3101, MAP 2302, or equivalents, or consent of instructor.* Introduction to the generation and use of vacuum for scientific research and industrial production. Kinetic theory of gases discussed

as necessary to understand vacuum phenomena. Description of components and materials, vacuum systems design and uses in metallurgy, electronics, physics, and chemistry.

EMA 5365: Biomimetic Synthesis (3) *Prereq: EMA 3010 or equivalent.* Investigation of processes utilized by organisms to control mineralization of their hard parts, to gain understanding of mechanisms used by them to obtain precise control over size, shape, texture, orientation, and composition.

EMA 6001: Properties of Materials - A Survey (3) *Prereq: Bachelor's degree in physics, chemistry, or engineering.* Review of physical properties of materials such as mechanical, electrical, optical, magnetic, and thermal properties.

EMA 6005: Thin and Thick Films (3) *Prereq: EMA 3010, CHM 2046, PHY 3048, or equivalents.* Techniques for depositing thin metallic semiconductor and dielectric films. The relationships between deposition technique and thin film properties. Properties unique to thin films.

EMA 6105: Fundamentals and Applications of Surface Science (3) *Prereq: CHM 2045, MAP 2302, or consent of instructor.* Fundamental and experimental description of phenomena occurring at surface of solids, including structure, composition, atomic and molecular processes, and electronic properties. Experimental approaches and data used to support theoretical models.

EMA 6106: Advanced Phase Diagrams (3) Phase diagrams considering systems with as many as four components; emphasis on pressure temperature composition diagrams.

EMA 6107: High Temperature Materials (3) Physical and mechanical metallurgy. Principles of strengthening alloys, alloy and process selection, alloy development, and design principles for elevated temperature applications.

EMA 6109: Physical Chemistry of High Temperature Materials (3) Interrelated aspects of solid state chemistry critical to materials science and chemical education. Science behind adapting inorganic materials for specific purposes making matter do what is wanted by positioning atoms in their proper structures

EMA 6110: Electron Theory of Solids for Materials Scientists I (3) Wave equation and its application to free electrons, bound electrons, and electrons in crystals. Electron-band theory and its applications. Electrical properties of metals, alloys, and semiconductors, heat capacity and thermal properties.

EMA 6111: Electron Theory of Solids for Materials Scientists II (3) Atomistic (classical) and electron theory of optical properties of metals, alloys, and dielectrics. Nonlinear optics, lasers. Raman-spectra.

EMA 6114: Advanced Materials Principles 2 (3) *Prereq: EMA 6313.* Structure, properties, processing, and applications of semiconductors, metals, ceramics, polymers, and biomaterials. Structure and properties of thin films, surfaces, and interfaces.

EMA 6128: Materials Microstructures (3) *Prereq: EMA 6316 or equivalent.* Geometry of microstructures: kinematics and kinetics of microstructural evolution in materials processing.

EMA 6136: Diffusion, Kinetics, and Transport Phenomena(3) *Prereq: EMA 4125 or equivalent.* Physical basis, equation, and theories of diffusion, tracer, chemical, multicomponent, and multiphase diffusion in general force fields.
EMA 6165: Polymer Physical Science(3) *Prereq: EMA 3066.* Solid state properties of amorphous and semi-crystalline polymers.
EMA 6166: Polymer Composites(3) Physical and mechanical properties of polymers and polymer composites as related to preparation and microstructure.
EMA 6226: Synthesis and Properties of Metallic Nanostructures (3) Up-to-date review of metallic nanostructures including fabrication techniques, thermal stability, phase transformation, mechanical properties, magnetic properties, and applications.
EMA 6227: Advanced Mechanical Metallurgy II (3) Continuation of EMA 6226.
EMA 6265: Mechanical Properties of Polymers (3) *Prereq: EMA 3066 or equivalent.* Linear and nonlinear viscoelastic behavior of polymers with emphasis on molecular and microstructure aspects.
EMA 6313: Advanced Materials Principles I (3) *Prereq: consent of instructor.* Crystal structure, bonding, order and disorder in solids. Phase diagrams and phase transitions. Mechanical, optical, and electrical properties.
EMA 6315: Colloidal Hydrodynamics(3) Background on physical side of flow of colloidal dispersions for graduate students from different engineering disciplines. Low Reynolds number hydrodynamics and role of surface forces on stability of rheology of colloidal dispersions.
EMA 6316: Materials Thermodynamics(3) *Prereq: EMA 4314.* Thermodynamics of materials systems, surfaces in solids, irreversible processes.
EMA 6319: Applied Colloid and Interfacial Chemistry for Engineers (3) *Prereq: EMA 6316 or equivalent.* Principles used to disperse powders in liquids with practical examples relating to ceramic and metal particle processing properties.
EMA 6412: Synthesis and Characterization of Electronic Materials (3) *Prereq: undergraduate-level thermodynamics, kinetics, and electrical properties of materials or equivalent.* Principles of materials growth and characterization in electronic and photonic industries. Bulk and epitaxial growth technologies, corresponding characterization methods for evaluation and quality control. Theoretical bases for these techniques.
EMA 6445: Electroceramics(3) Basic physical, chemical and mathematical principles of ceramic conductors, dielectrics and ferroelectrics and their applications are discussed. Emphasizes structure-processing-microstructure property relationships.
EMA 6446: Solid State Ionics (3) *Prereq: EMA 6316 or equivalent, or consent of instructor.* Defect solid state and its relation to electronic properties of ceramic materials; defect equilibria and transport; influence of chemical and electric potentials and interfaces; and application of ionically conducting solids in solid-

state electrochemical transducer systems and devices.

EMA 6448: Ceramic Processing (3) Introduction to the science of ceramic processing, with emphasis on theoretical fundamentals. Examples of state-of-the-art industrial processes discussed.

EMA 6461: Polymer Characterization (3) *Prereq: EMA 3066.* Use of a broad variety of spectroscopic and other scattering phenomena in polymer research.

EMA 6507: Scanning Electron Microscopy and Microanalysis(3) *Prereq: EMA 3513C or equivalent.* Principles and theories of microscopy with an emphasis on scanning electron microscopy (SEM). Provides the necessary theoretical background to become an effective user of MAIC SEM facilities.

EMA 6507L: Scanning Electron Microscopy and Microanalysis Lab (1) *Coreq: EMA6507.* Practical training to become a proficient user of MAIC SEM facilities, leading to an authorization as a JEOL SEM-6400 user at the MAIC.

EMA 6510: Survey of Materials Analysis Techniques (3) *Prereq: EMA 3513C, 4145 or equivalent.* Principles and techniques used in characterization of materials. Chemical, microstructural, and surface analysis of materials; metals, ceramics, polymers, and semiconductor systems.

EMA 6512C: X-ray Scattering for Thin Film Analysis (3) *Prereq: consent of instructor.* Theoretical basis of x-ray scattering from thin films, multilayers and single crystals for characterizing their thickness, mass density, surface and interface morphology, structural quality, and orientation.

EMA 6518: Transmission Electron Microscopy (3) *Prereq: EMA 3513C or equivalent.* Instrumentation associated with transmission electron microscopy. Kinematical and dynamical theories of diffraction contrast and their application. Diffraction analysis in TEM for structural determination. Analytical techniques for obtaining structural and compositional information at high spatial resolution. Phase contrast and high resolution electron microscopy.

EMA 6518L: Transmission Electron Microscopy Laboratory (1) Specimen preparation for analysis in TEM. Demonstration of principles of contrast theories. Specialized methods for characterizing structure and composition of materials at high spatial resolution.

EMA 6519L: Specialized Research Techniques in Materials Science (1-2; max: 10) *Prereq: EMA 6507C or equivalent.* Utilizing primarily STEM, TEM, SEM, EMP, FIM, and optical metallography.

EMA 6580: Science of Biomaterials I (3) *Prereq: undergraduate chemistry.* Introduction to variables that control compatibility and performance of biomaterials, including physical and chemical properties, corrosion, fatigue, and interfacial histochemical changes.

EMA 6581C: Polymeric Biomaterials (4) *Prereq: undergraduate chemistry and EMA 3066.* Biomedical implant and device applications of synthetic and natural polymers. Biocompatibility and interfacial properties of polymers in physiological environment, especially concerning short-term devices (catheters) and long-term implants (intraocular lenses, vascular and mammary prostheses,

etc.).

EMA 6589: Mechanical Behavior of Biomaterials (3) *Prereq: EMA 4223 or equivalent.* Basis for elastic and viscoelastic response of biological materials to stress and strain. Foundation for composite behavior of organic-organic and organic-inorganic materials. Description of modeling biological structures to achieve mechanical optimization.

EMA 6590: Advances in Biomaterials and Tissue Engineering for Healthcare (3) Use of new bioactive and bio-nano structures, surfaces and properties for healthcare applications, including tissue engineering, regenerative medicine, stem cell engineering, protein therapeutics, and bio-photonics testing of cell-material interactions. Socio-economic issues affecting cost and availability of new materials and technologies for healthcare.

EMA 6591: Clinical Applications of Biomaterials and Tissue Engineering (3) Biomaterials, implants, devices, and new concepts in regenerative medicine and tissue engineering. Current technologies for replacement of tissues and organs, with emphasis upon case histories of specific medical and dental clinical applications, including economic and ethical concern analyses.

EMA 6616: Advanced Electronic Materials Processing (3) *Prereq: EMA 4614 or equivalent.* Materials requirements for high speed devices and processing modules needed for their fabrication. Examples of current industrial processes.

EMA 6625: Advanced Metals Processing(3) *Prereq: EMA 4125 or equivalent.* Advanced treatment of solidification phenomena during metals processing. Topics to include nucleation, kinetics, solidification structure, segregation, and effects of processing variables on structure and properties.

EMA 6667: Polymer Processing (2-3; max: 3) *Prereq: EMA 3066 or equivalent.* Major processing methods for polymers and polymeric composites as related to the rheological behavior of these systems. Synthesis of polymers via industrial processes.

EMA 6715: Fracture of Brittle Materials (3) *Prereq: EMA 4223, EGM 3520, or equivalent.* Latest concepts in deformation, fracture, and toughening of brittle materials. Application of fracture mechanics and fractals to failure of brittle materials. Development of an approach to failure analysis for brittle materials.

EMA 6803: Classical Methods in Computational Materials Science (3) Proficiency developing and using common tools for computational materials research at the atomic level.

EMA 6804: Quantum Methods in Computational Materials Science (3) *Prereq: EMA 6313, C/C++, Fortran, or other suitable scientific programming language.* Theory, methods, and application of common quantum mechanical software (GAUSSIAN and VASP) for computational study of materials.

EMA 6805: Mathematical Methods in Materials Science I (2) Review of mathematical methods with emphasis upon applications in materials science and engineering.

EMA 6806: Mathematical Methods in Materials Science II (2) *Prereq: EMA 6805 or equivalent.* Applications of advanced

differential equations, transform methods, and computational analysis.

EMA 6808: Error Analysis and Optimization Methodologies in Materials Research (3) *Prereq: ESI 4905, EIN 6912, STA 6166 and 6167; or consent of instructor.* Statistical approach to materials research, basic and relevant statistical concepts, error analysis, factorial matrices, reducing variance, nested designs and sampling plans, mixture designs, optimization techniques, response surface method, and Taguchi method.

EMA 6905: Individual Work in Materials Science and Engineering (1-4; max: 8)

EMA 6910: Supervised Research (1-5; max: 5) S/U.

EMA 6936: Seminar in Materials Science and Engineering (1; max: 14) Offered in fall and spring. Required of all students. S/U.

EMA 6938: Special Topics in Materials Science and Engineering (1-4; max: 6)

EMA 6971: Research for Master's Thesis (1-15) S/U.

EMA 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

EMA 7980: Research for Doctoral Dissertation (1-15) S/U.

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Mathematics

College of Liberal Arts and Sciences

Graduate Faculty

Chair: J. E. Keesling. *Graduate Coordinator:* P. L. Robinson.
Complete faculty listing by department: Follow this link

The Department of Mathematics offers the degrees of Doctor of Philosophy, Master of Science and Master of Arts, and the Master of Arts in Teaching and Master of Science in Teaching, each with a major in mathematics. Complete descriptions of the minimum requirements for these degrees are provided in the General Information section of this catalog.

Interdisciplinary Programs—The Department offers a co-major program in conjunction with the Statistics Department leading to the Doctor of Philosophy degree in mathematics and statistics. The Department is also a partner in the interdisciplinary concentration in quantitative finance, along with the Statistics, Industrial and Systems Engineering, and Finance, Insurance, and Real Estate Departments.

Combined Program—The Department has an accelerated bachelor's/master's program designed for superior undergraduate students who have the ability to pursue such a plan of study leading to the Master of Science or Master of Arts degree. The main feature of the program is that up to 12 semester hours of approved graduate level mathematics courses may be used as dual credit for both the undergraduate and the graduate degree. All other requirements for both the bachelor's degree and the master's degree must be met. For admission requirements for this program,

see the undergraduate coordinator.

There are opportunities for concentrated study in a number of specific areas of pure and applied mathematics at both the master's and doctoral levels. The faculty directs studies and research in algebra, number theory, analysis, geometry, topology, logic, differential equations, dynamical systems, probability theory, numerical analysis, numerical optimization, approximation theory, combinatorial analysis, graph theory, computer applications, biomathematics, mathematical physics, inverse problems, and medical imaging. In addition to the requirements of the Graduate School, the minimum prerequisite for admission to the program of graduate studies in mathematics is the completion, with an average grade of B or better, of at least 24 credits of undergraduate mathematics, including a full year of calculus and three semesters of appropriate work beyond the calculus. The most appropriate courses for this purpose are advanced calculus, linear algebra and abstract algebra. Students lacking part of the requirements will be required to make up the deficiency early in their graduate work. Prerequisites to individual courses should be determined before registration by consultation with the instructor concerned. Some of the courses listed are offered only as needed. Since times of offering courses are estimated a year in advance, certain changes may be made if needs are known by the Department. The courses MAA 5228, MAA 5229, MAS 5311, and MAS 5312 are required for all advanced degree programs in mathematics. The requirements for the master's degree nonthesis option include a minimum of 32 semester hours of course work. Students pursuing the master's degree in mathematics must pass two comprehensive written examinations, one in algebra and one in analysis. Students pursuing the master's degree with a specialization in applied mathematics have two options: the examination option requires passage of the algebra and analysis examinations; the thesis option requires instead the preparation and oral defense of a thesis on original research conducted under the supervision of a faculty adviser. Students pursuing the Master of Arts in Teaching or the Master of Science in Teaching degree must prepare a teaching portfolio and pass an oral examination. Each of these programs normally requires two years for completion. The requirements for a doctoral degree include 36 hours of 6000-level course work in mathematics; no hours of teaching, colloquium, dissertation, or individual work will count toward this requirement. To become a candidate for the doctoral degree, the student must pass a comprehensive preliminary examination with written and oral components administered by the Department. The doctoral student must also pass a reading knowledge examination in one of the following foreign languages: French, German, or Russian. The dissertation is an important requirement for the doctoral degree in mathematics. The topic for the dissertation may be chosen from a number of areas of current research in pure and applied mathematics. Every graduate student is expected to attend the regular colloquium. Details concerning all

requirements for graduate degrees in mathematics may be obtained by writing the Mathematics Department Graduate Selection Committee or consulting the Department website, http://www.math.ufl.edu.

MAA 5104: Advanced Calculus for Engineers and Physical Scientists I (3)
MAA 5105: Advanced Calculus for Engineers and Physical Scientists II (3) *Prereq: MAA 5104.*
MAA 5228: Modern Analysis I (3) *Prereq: advanced calculus.* Topology of metric spaces, numerical sequences and series, continuity, differentiation, the Riemann-Stieltjes integral, sequences and series of functions, the Stone-Weierstrass theorem, and the Lebesgue theory.
MAA 5229: Modern Analysis II (3) *Prereq: MAA 5228.*
MAA 5404: Introduction to Complex Variables for Engineers and Physical Scientists (3)
MAA 6236: Mathematical Analysis for Statisticians (3) *Coreq: STA 6326.* Numerical sequences and series, limits, continuity, differentiation, integration, series of functions. Applications to probability and statistics stressed.
MAA 6406: Complex Analysis I (3) *Prereq: MAA 5229.* Rapid survey of properties of complex numbers, linear transformations, geometric forms and necessary concepts from topology. Complex integration. Cauchy's theorem and its corollaries. Taylor series and the implicit function theorem in complex form. Conformality and the Riemann-Caratheodory mapping theorem. Theorems of Bloch, Schottky, and the big and little theorems of Picard. Harmonicity and Dirichlet's problems.
MAA 6407: Complex Analysis II (3) *Prereq: MAA 6406.*
MAA 6616: Analysis I (3) *Prereq: MAA 5229.* Fundamentals of measure and integration theory, including L^p spaces and the Radon-Nikodym theorem. Introduction to functional analysis: Banach spaces, Hilbert spaces, and the theory of linear operators.
MAA 6617: Analysis II (3) *Prereq: MAA 6616.* Continuation of MAA 6616 Analysis I.
MAA 7526: Advanced Topics in Functional Analysis I (3; max: 6) *Prereq: MAA 6617, 6332.* Algebraic and topological approach to current material and methods in analysis.
MAA 7527: Advanced Topics in Functional Analysis II (3; max: 6) *Prereq: MAA 7526.*
MAD 6206: Combinatorial Theory I (3) Matching theory, Ramsey's theorem, lattice theory, Mobius inversion, generating functions. Polya's theorem, matroids, applications, block designs, graph theory.
MAD 6207: Combinatorial Theory II (3) *Prereq: MAD 6206.*
MAD 6406: Numerical Linear Algebra (3) *Prereq: MAS 3114, 4105, or 4124; and programming language.* Topics most useful in applications with emphasis on numerical techniques: systems of linear equations, positive definite and toeplitz systems, least squares problems, singular value decomposition, and eigenvalues.

Numerical stability and efficiency of algorithms as well as effect of perturbations on the problem. Companion to MAD 6407.

MAD 6407: Numerical Analysis (3) *Prereq: MAA 4212, 5105, or 5229; and programming language.* Numerical techniques to solve systems of nonlinear equations to approximate functions, to compute derivatives, to evaluate integrals, and to integrate systems of differential equations. Introduction to numerical techniques for partial differential equations. Companion to MAD 6406.

MAD 7396: Topics in Combinatorial Theory I (3; max: 6) *Prereq: MAS 5312.* Topics chosen from among graph theory, coding theory, matroid theory, finite geometries, projective geometry, difference methods, and Latin squares.

MAD 7397: Topics in Combinatorial Theory II (3; max: 6) *Prereq: MAD 7396.*

MAE 6940: Supervised Teaching (1-5; max: 5) *Prereq: consent of graduate adviser.* S/U.

MAE 6943: Internship in College Teaching (3; max: 6) *Prereq: consent of graduate adviser.*

MAP 5304: Intermediate Differential Equations for Engineers and Physical Scientists (3)

MAP 5345: Introduction to Partial Differential Equations (3)

MAP 5489: Modeling in Mathematical Biology (3) *Prereq: undergraduate course in ordinary differential equations.* Mathematical models of biological systems. Models of growth, predator-prey populations, competition, chemostat, epidemics, excitable systems, and analytical tools such as linearization, phase-plane analysis, Poincare-Bendixson theory, Lyapunov functions, and bifurcation analysis.

MAP 6208: Numerical Optimization (3) *Prereq: MAD 6406 and MAD 6407 or consent of instructor.* Unconstrained and constrained optimization, linear and nonlinear programming, gradient, multiplier, and quasi-Newton methods. Penalty, multiplier, and projection methods for constrained problems.

MAP 6217: Introduction to Calculus of Variations for Engineers and Physical Scientists (3) *Prereq: MAP 5304, MAS 5157 or equivalent.* Extremum problems, first variation. Euler equation problems with fixed and movable boundaries. Lagrange multiplier methods for problems with constraints, canonical form, second variation, applications to physics and engineering.

MAP 6327: Applied Differential Equations I (3) *Prereq: MAA 5229.* Theory and methods for solving linear and nonlinear systems of differential equations and partial differential equations. Applications and computer techniques included.

MAP 6356: Partial Differential Equations I (3) *Prereq: MAA 5229, MAP 5345 or MAP 6506.* Cauchy-Kowalewski theorem, first order equations, classification of equations, hyperbolic equations, elliptic equations, parabolic equations, hyperbolic systems, nonlinear hyperbolic systems, existence theory based on functional analysis. Applications to physical sciences.

MAP 6357: Partial Differential Equations II (3) *Prereq: MAP 6356.*

MAP 6375: Numerical Partial Differential Equations (3) *Prereq: MAD 6406 and MAD 6407 or consent of instructor.* Introduction to partial differential equations and fundamental concepts. Parabolic equations: finite differences, consistency, convergence and stability, 2- and 3-dimensional problems. Elliptic equations: finite differences, solution to linear equations, boundary integral equation methods. Hyperbolic equations: finite differences and method of characteristics. Introduction to finite elements. Methods of lines.

MAP 6376: Finite Element Method (3) *Prereq: MAD 6406 and MAD 6407 or consent of instructor.* Variational formulations of partial differential equations, finite element approximations; addresses theoretical framework and numerical issues. Finite element spaces in one, two, and three dimensions. Error analysis. Nonconforming finite element spaces. Isoparametric approximations to boundary conditions.

MAP 6467: Stochastic Differential Equations and Filtering Theory I(3) Introduction to random functions; Brownian motion process. Ito's stochastic integral; Ito's stochastic calculus; stochastic differential equations. Linear filtering; Kalman filtering; nonlinear filtering theory.

MAP 6468: Stochastic Differential Equations and Filtering Theory II(3) *Prereq: MAP 6467.*

MAP 6472: Probability and Potential Theory I (3) *Prereq: MAA 5229 or STA 6326.* Random variables, independence and conditioning. Laws of large numbers and the Central Limit Theorem. Stochastic processes, martingales, Gaussian processes, Markov processes, potentials and excessive functions.

MAP 6487: Biomathematics Seminar I (3) *Prereq: MAC 2312, MAP 2302, STA 6326 or MAP 4102.* Stochastic processes, differential equations, and reaction-diffusion equations used to model various biological processes. Among the applications covered are the following: population dynamics, epidemiology, genetics, enzyme kinetics, cell differentiation and morphogenesis, nerve impulse generation, and aggregation of slime mold. The course is designed to benefit graduate students in biological sciences, as well as mathematics.

MAP 6488: Biomathematics Seminar II (3) *Prereq: MAP 6487.* Continuation of MAP 6487.

MAP 6505: Mathematical Methods of Physics and Engineering (3) *Prereq: MAA 5404, MAP 5304, MAP 5345, MAS 5157 or equivalent.* Orthogonal functions; theory of distributions; integral equations; eigenfunctions and Green's functions; special functions; boundary and initial value problems, with emphasis on potential theory (Laplace and Poisson equations); the wave equation; and the diffusion equation.

MAP 6506: Mathematical Methods of Physics and Engineering II (3) *Prereq: MAP 6505.*

MAP 6941: Internship in Applied Mathematics (1-5; max: 9) *Prereq: consent of supervisory committee chair.* Mathematical research on projects sponsored by a university laboratory or an off-campus industrial internship program.

MAP 7436: Seminar in Applied Mathematics I (3; max: 6) Various topics in applications of mathematics both classical and in areas of current research.
MAP 7437: Seminar in Applied Mathematics II (3; max: 6)
MAS 5157: Vector Analysis (3)
MAS 5311: Introductory Algebra I (3) *Prereq: MAS 4105 and 4302.* The basic algebraic systems: groups, rings, vector spaces, and modules. Linear transformations, matrices, and determinants.
MAS 5312: Introductory Algebra II (3) *Prereq: MAS 5311.*
MAS 6331: Algebra I (3) *Prereq: MAS 5312.* Solvable and nilpotent groups, Jordan-Holder theorem, abelian groups, Galois theory, Noetherian rings, Dedekind domains, Jacobson radical, Jacobson density theorem, Wedderburn-Artin theorem.
MAS 6332: Algebra II (3) *Prereq: MAS 6331.*
MAS 7215: Theory of Numbers (3) *Prereq: 2 of MAA 6407, 6617, MAS 6332.* Introduction to theory of numbers; theorems on divisibility; congruence, number-theoretic functions; primitive roots and indices; quadratic reciprocity law; Diophantine equations and continued functions.
MAS 7216: Theory of Numbers II (3) *Prereq: MAS 7215.*
MAS 7396: Advanced Topics in Algebra I (3; max: 6) *Prereq: MAA 6407, 6617, MAS 6332 or MTG 6347.* Current topics in algebra.
MAT 6905: Individual Work (3; max: 9)
MAT 6910: Supervised Research (1-5; max: 5) S/U.
MAT 6932: Special Topics in Mathematics (3; max: 9) *Prereq: consent of graduate adviser, who should be consulted well in advance of registration.*
MAT 6971: Research for Master's Thesis (1-15) S/U.
MAT 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
MAT 7980: Research for Doctoral Dissertation (1-15) S/U.
MHF 5107: Introduction to Set Theory (3) Basic axioms and concepts of set theory, axiom of choice, Zorn's lemma, Schroder-Bernstein theorem, cardinal numbers, ordinal numbers, and the continuum hypothesis.
MHF 5207: Foundations of Mathematics (3) Models and proofs. Foundations of the real and natural number systems. Algorithms. Turing Machines, undecidability and independence. Examples and applications in algebra, analysis, geometry, and topology.
MHF 6306: Mathematical Logic I (3) Languages, models, and theories; Godel's completeness and incompleteness theorems; formal number theory and axiomatic set theory; applications to other areas of mathematics.
MHF 6307: Mathematical Logic II (3) *Prereq: MHF 6306.*
MTG 5316: Introduction to Topology I (3) Basic axioms and concepts of point-set topology, compactness, connectedness, separation axioms, metric spaces, metrization. Tietze extension theorem. Urysohn lemma, Tychonoff theorem, fundamental group.

MTG 5317: Introduction to Topology II (3) *Prereq: MTG 5316.*
MTG 5411: Introduction to Fractal Geometry (3) *Prereq: advanced calculus or consent of instructor.* Introduction to techniques for generating and analyzing fractal sets. Hausdorff dimension, self-similarity, and iterated function systems. If time permits, Brownian paths, Julia sets, and Mandelbrot set.
MTG 5412: Introduction to Dynamical Systems and Chaos (3) *Prereq: advanced calculus or consent of instructor.* Introduction to nonlinear dynamical systems and chaos. One-dimensional systems, bifurcation theory, symbolic dynamics, Sarkovskii's theorem, Schwarzian derivative, Bernoulli shifts and subshifts of finite type, and kneading theory. If time permits, toral automorphisms, Henon map and complex dynamics.
MTG 6256: Differential Geometry I (3) *Prereq: consent of instructor.* Foundations of the theory of smooth manifolds, vector fields, and differential forms. Topics chosen from a list including differential topology, Lie groups, symplectic geometry, Riemannian geometry, and applications to physics.
MTG 6257: Differential Geometry II (3) *Prereq: MTG 6256.*
MTG 6346: Topology I (3) *Prereq: MTG 5317.* A basic introduction to advanced topology. Topics covered include general topology, algebraic topology, homotopy theory and topology of manifolds.
MTG 6347: Topology II (3) *Prereq: MTG 6346.*
MTG 6401: Ergodic Theory and Dynamical Systems I (3) *Prereq: MTG 5317, MAA 6617, or consent of instructor.* Periodic points, recurrence, nonwandering and chain recurrent sets, topological conjugacy, minimal sets. Topological entropy, metric entropy. Measure preserving transformations, ergodicity, mixing. Birkhoff's ergodic theorem. Bernouilli shifts. Anosov diffeomorphisms, structural stability, hyperbolic sets. Basic sets, symbolic dynamics, Markov partitions. Lyapunov exponents, KAM (Kolmogorov, Arnold, Moser) theory.
MTG 6402: Ergodic Theory and Dynamical Systems II (3) *Prereq: MTG 6401.* Continuation of MTG 6401.
MTG 7396: Advanced Topics in Topology I (3; max: 6) *Prereq: MTG 6347.* Topics change yearly.
MTG 7397: Advanced Topics in Topology II (3; max: 6)

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Mechanical and Aerospace Engineering

College of Engineering

Graduate Faculty

Chair: S. Balachandar. *Graduate Coordinator:* D. W. Mikolaitis.
Complete faculty listing by department: Follow this link

The Department of Mechanical and Aerospace Engineering offers the degrees of Master of Science (thesis or nonthesis), Master of Engineering (thesis or nonthesis), Engineer, and Doctor of Philosophy in aerospace engineering and mechanical engineering. Minimum requirements for these degrees are given in the *General Information* section of this catalog. Additional information can be found at http://www.mae.ufl.edu/graduate. Prospective students are expected to have strong backgrounds in engineering. For the first year of study, each student is generally required to take a minimum of three regular courses each semester. There are three areas of specialization available for graduate studies: dynamics, systems, and control; solid mechanics, design, and manufacturing; thermal science and fluid dynamics. Within a specialization there are unique opportunities to conduct analytical, experimental, and/or numerical study in a wide variety of challenging problems. The Department offers a combined bachelor's/master's degree program. Contact the graduate coordinator for information.

BME 5580: Introduction to Microfluidics and BioMEMS (3)
Prereq: EGN 3353C or consent of instructor. Introduction to concepts of miniaturization, materials and methods for microfabrication, principles of microfluidics, and biological applications of microfluidic devices and biomedical microelectromechanical systems.

EAS 5938: Special Topics in Aerospace Engineering (1-4; max: 8)
EAS 6135: Molecular Theory of Fluid Flows (3) *Prereq: EGM 6812 or equivalent.* Introduction to the molecular dynamics of gases and liquids, the Boltzmann equation, Chapman-Enskog expansion and derivation of Euler and Navier-Stokes equations, and lattice Boltzmann methods; and application to gas, liquid, and multiphase flows.
EAS 6138: Gasdynamics (3) *Prereq: EAS 4103 or EML 5714.* Theory of sound waves, subsonic and supersonic flows, shockwaves, explosions and implosions.
EAS 6242: Advanced Structural Composites (3) *Prereq: EGM 3520.* Micro- and macro-behavior of a lamina. Stress transfer of short fiber composites. Classical lamination theory, static analysis of laminated plates, free-edge effect, failure modes.
EAS 6415: Guidance and Control of Aerospace Vehicles (3) *Prereq: EAS 4412 or equivalent.* Applying modern control theory to aerospace vehicles. Parameter identification methods applied to aircraft and missiles.
EAS 6905: Aerospace Research (1-6; max: 12 including EGM 5905 and EGM 6905)
EAS 6910: Supervised Research (1-5; max: 5) S/U.
EAS 6935: Graduate Seminar (1; max: 6) S/U option.
EAS 6939: Special Topics in Aerospace Engineering (1-6; max: 12) Laboratory, lectures, or conferences covering selected topics in space engineering.
EAS 6971: Research for Master's Thesis (1-15) S/U.
EAS 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
EAS 7980: Research for Doctoral Dissertation (1-15) S/U.
EGM 5005: Laser Principles and Applications (3) *Prereq: consent of instructor.* Applications of lasers for lidar aerodynamic and structural testing and for cutting and welding of materials.
EGM 5111L: Experimental Stress Analysis (3) *Prereq: EGM 3520.* Introduction to techniques of experimental stress analysis in static systems. Lecture and laboratory include applications of electrical resistance strain gauges, photoelasticity, brittle coatings, moire fringe analysis, and X-ray stress analysis.
EGM 5121C: Data Measurement and Analysis (3) Tools for random data analysis (including types of random data, mean values, mean-square values, probability density and distribution functions, moments and characteristic functions, and spectral and correlation analysis); bias and random error estimates in data measurements; input-output system models; and measurement examples.
EGM 5533: Applied Elasticity and Advanced Mechanics of Solids (3) *Prereq: EGM 3520.* Bars, beams, thin-walled structures, and simple continua in the elastic and inelastic range. Virtual work

approaches, elastic energy principles, plastic limit theorems, and creep deformation procedures. Introduction to instability and fracture mechanics. Design applications.

EGM 5584: Biomechanics of Soft Tissue (3) *Prereq: EGN 3353C and EGM 3520.* Introduction to solid and fluid mechanics of biological systems. Rheological behavior of materials subjected to static and dynamic loading. Mechanics of cardiovascular, pulmonary, and renal systems. Mathematical models and analytical techniques used in biosciences.

EGM 5816: Intermediate Fluid Dynamics (3) *Prereq: EGN 3353C (or CWR 3201), MAP 2302.* Basic laws of fluid dynamics. Introduction to potential flow, viscous flow, boundary layer theory, and turbulence.

EGM 5933: Special Topics in Engineering Science and Mechanics (1-4; max: 8)

EGM 6006: Laser-Based Diagnostics (3) Introduction to laser-based measurement techniques. Emphasizes light scattering, raman spectroscopy, plasma spectroscopy, and fluorescence, including the underlying physics and also practical implementations.

EGM 6321: Principles of Engineering Analysis I (3) *Prereq: EGM 4313 or MAP 4305.* Solution of linear and nonlinear ordinary differential equations. Methods of Frobenius, classification of singularities. Integral representation of solutions. Treatment of the Bessel, Hermite, Legendre, hypergeometric, and Mathieu equations. Asymptotic methods including the WBK and saddle point techniques. Treatment of nonlinear autonomous equations. Phase plane trajectories and limit cycles. Thomas-Fermi, Emden, and van der Pol equations.

EGM 6322: Principles of Engineering Analysis II (3) *Prereq: EGM 4313 or MAP 4341.* Partial differential equations of first and second order. Hyperbolic, parabolic, and elliptic equations including the wave, diffusion, and Laplace equations. Integral and similarity transforms. Boundary value problems of the Dirichlet and Neumann type. Green's functions, conformal mapping techniques, and spherical harmonics. Poisson, Helmholtz, and Schroedinger equations.

EGM 6323: Principles of Engineering Analysis III (3) *Prereq: EGM 4313 or MAP 4341.* Integral equations of Volterra and Fredholm. Inversion of self-adjoint operators via Green's functions. Hilbert-Schmidt theory and the bilinear formula. The calculus of variations. Geodesics, Euler-Lagrange equation and the brachistochrone problem. Variational treatment of Sturm-Liouville problems. Fermat's principle.

EGM 6341: Numerical Methods of Engineering Analysis I (3) *Prereq: EGM 4313 or equivalent.* Finite-difference calculus; interpolation and extrapolation; roots of equations; solution of algebraic equations; eigenvalue problems; least-squares method; quadrature formulas; numerical solution of ordinary differential equations; methods of weighted residuals. Use of digital computer.

EGM 6342: Numerical Methods of Engineering Analysis II (3) *Prereq: EGM 6341 or consent of instructor.* Finite-difference

methods for parabolic, elliptic, and hyperbolic partial differential equations. Application to heat conduction, solid and fluid mechanics problems.

EGM 6352: Advanced Finite Element Methods (3) *Prereq: EGM 6351.* The discontinuous Galerkin method applied to transient problems. Optimization theory applied to formulating mixed FEM; treatment of constraints (e.g., incompressibility). General shape functions. Electromagnetics, heat, fluids, and solids. Other advanced topics.

EGM 6365: Structural Optimization (3) *Prereq: EML 4500, EGM 4350,EML 5526, or EGM 6451.* Structural optimization via calculus of variations. Applying techniques of numerical optimization to design trusses, frames, and composite laminates. Calculating the sensitivity of structural response. Approximation and fast reanalysis techniques. Optimality criteria methods.

EGM 6570: Principles of Fracture Mechanics (3) *Prereq: EGM 6611.* Introduction to the mechanics of fracture of brittle and ductile materials. Linear elastic fracture mechanics; elastic-plastic fracture; fracture testing; numerical methods; composite materials; creep and fatigue fracture.

EGM 6595: Bone Mechanics (3) Biology, composition, and mechanical properties of cortical bone tissue, cancellous bone tissue, and cartilage. Bone modeled as anisotropic elastic material, as bioviscoelastic material, and as composite material. Adaptation to stress and remodeling; articular cartilage.

EGM 6611: Continuum Mechanics (3) *Prereq: EGM 3520.* Tensors of stress and deformation. Balance and conservation laws, thermodynamic considerations. Examples of linear constitutive relations. Field equations and boundary conditions of fluid flow.

EGM 6671: Inelastic Materials (3) *Prereq: EGM 6611.* Virtual work, stability, extremum principles. Applications on the microscale, miniscale, and macroscale. Thermodynamics, internal variables, damage parameters, and time and temperature effects. Fracture mechanics. Finite elastoplasticity.

EGM 6812: Fluid Mechanics I (3) *Prereq: EGN 3353C.* Flow kinematics. Fundamental laws and equations in integral and differential forms. Potential flows. Introduction to laminar flows in simple geometries, laminar and turbulent boundary layer flows. External flows. One-dimensional compressible flows.

EGM 6813: Fluid Mechanics II (3) *Prereq: EGM 6812.* Mathematical and physical structures of the Navier-Stokes equation. Exact solutions of the Navier-Stokes equation for viscous flows. Low Reynolds number flows. Incompressible and compressible laminar boundary layer flows. Free shear flows. Energy equation and heat transfer. Unsteady flows. Instability. Turbulence.

EGM 6855: Bio-Fluid Mechanics and Bio-Heat Transfer (3) *Prereq: undergraduate fluid mechanics.* Biothermal fluid sciences. Emphasizes physiological processes occurring in human blood circulation and underlying physical mechanisms, from an engineering perspective.

EGM 6905: Individual Study (1-6; max: 12 including EGM 5905

and EAS 6905)
EGM 6910: Supervised Research (1-5; max: 5) S/U.
EGM 6934: Special Topics in Engineering Mechanics (1-6; max: 12)
EGM 6936: Graduate Seminar (1; max: 6) Discussions and presentations in the fields of graduate study and research. S/U option.
EGM 6971: Research for Master's Thesis (1-15) S/U.
EGM 7819: Computational Fluid Dynamics (3) *Prereq: EGM 6342 and 6813 or equivalent.* Finite difference methods for PDE. Navier-Stokes equations for incompressible and compressible fluids. Boundary fitted coordinate transformation, adaptive grid techniques. Numerical methods and computer codes for fluid flow problems.
EGM 7845: Turbulent Fluid Flow (3) *Prereq: EGM 6813 or equivalent.* Definition of turbulence, basic equations of motion. Instability and transition. Statistical methods, correlation and spectral functions. Experimental methods, flow visualization. Isotropic homogeneous turbulence. Shear turbulence, similitude, the turbulent boundary layer, rough turbulent flow. Jets and wakes. Heat convection, thermally driven turbulence.
EGM 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
EGM 7980: Research for Doctoral Dissertation (1-15) S/U.
EML 5045: Computational Methods for Design and Manufacturing (3) *Prereq: EML 3023 or consent of instructor.* Geometric and solid modeling, feature-based design, and parametric models. Applications to product design, rapid prototyping, and manufacturing.
EML 5104: Classical and Statistical Thermodynamics (3) First and second laws of thermodynamics. Free energy and chemical equilibrium. Micro- and macroscopic states. Fermi-Dirac and Bose-Einstein statistics. Partition functions.
EML 5124: Two-Phase Flow and Boiling Heat Transfer (3) *Prereq: introductory-level fluid mechanics and heat transfer.* Basic principles, mathematical modeling, and applications of two-phase flow, boiling heat transfer, and evaporation and condensation.
EML 5131: Combustion(3) *Prereq: EML 3101 or consent of instructor.* Chemical thermodynamics, chemical kinetics, flame propagation, detonation and explosion, combustion of droplets and spray.
EML 5215: Analytical Dynamics I (3) *Prereq: dynamics.* Analytical methods of statics and dynamics. Principle of virtual work, holonomic and nonholonmic constraints. Lagrange equations for constrained and unconstrained systems, conservation laws, stability analysis by perturbation about steady state, Jacobi first integral, generalized impulse and momentum.
EML 5223: Structural Dynamics (3) *Prereq: EML 4220.* Vibration analysis and synthesis of continuous and multidegree-of-freedom

lumped-parameter systems. Computational and experimental techniques in modal analysis.

EML 5224: Acoustics (3) *Prereq: ENG 3353C, EGM 4313, or consent of instructor.* Theory of sound. Plane waves and three-dimensional acoustic fields. Sound transmission and reflection. Dissipation, radiation, and scattering.

EML 5311: Control System Theory (3) Analyzing dynamic mechanical engineering control systems. Introduction to classical, digital, and state space techniques. Modeling, stability, transient response, and frequency response. Considers implementation.

EML 5318: Computer Control of Machines and Processes (3) *Prereq: CGS 2425 or consent of instructor.* Basic concepts, including hardware and software. Modeling of machines, processes, and their controllers.

EML 5455: Clean Combustion Technology (2) Latest developments in combustion of solid fuels, cocombustion of fuels, fluidized bed combustion, and gasification for combustion turbine applications.

EML 5465: Energy Management for Mechanical Engineers (3) *Prereq: consent of instructor.* Energy use analysis in building envelopes, mechanical systems, and industrial processes. Energy conservation strategies and design techniques. Alternative energy applications.

EML 5515: Gas Turbines and Jet Engines (3) *Prereq: EML 4419 or consent of instructor.* Theory and analysis of gas turbine engines and major components.

EML 5516: Design of Thermal Systems (3) *Prereq: EML 4141 and 4702 or equivalent.* Modeling of thermal equipment; system simulation; optimization, search methods, thermal system design and optimization using dynamic, geometric, and linear programming; simulation of large systems, vector and reduced gradient searches.

EML 5526: Finite Element Analysis and Application (3) *Prereq: EML 3520 or consent of instructor.* Fundamentals, including discrete system analysis, dynamic analysis of structures, steady state and transient heat transfer analysis, and incompressible fluids analysis. Modeling, analysis, and design using FEA software.

EML 5591: Biometrics (3) *Prereq: EGM 2511, EMA 3010, EEL 3003 or 3111, EML 3023.* Examines human/machine interface. Introduces basic human anatomy. Explores physical capabilities and limitations, in the context of practical design problems. Investigates injury prevention, both acute and cumulative.

EML 5595: Mechanics of the Human Locomotor System (3) *Prereq: EGM 3401, 3520.* Analyzing the human musculoskeletal system as sensors, levers, and actuators. Joint articulations and their mechanical equivalents. Kinematic and kinetic analysis of human motion. Introduction to modeling human body segments to analyze human activities.

EML 5598: Orthopedic Biomechanics (3) *Prereq: mechanics of materials.* Mechanical properties of the human body's hard and soft tissues. Mechanical and biological considerations for repair and

replacement of soft and hard tissues and joints. Fracture fixation, orthopedic implants for hip and knee, and orthotic and prosthetic devices.

EML 5605: Advanced Refrigeration (3) *Prereq: EML 4601.* Analysis and design considerations for vapor compression, absorption, steam-jet, thermoelectric, and air refrigeration systems.

EML 5714: Introduction to Compressible Flow(3) One-dimensional and quasi-one-dimensional compressible fluid flows. Mach waves, normal shocks, oblique shocks, Prandtl-Meyer expansions, isentropic flow with area change, Fanno flow, Rayleigh flow.

EML 6146: Microscale Heat Transfer (3) *Prereq: EML 4141.* Kinetic theory and transport phenomena; fundamentals of statistical mechanics; microscale heat conduction, convection and radiation; applications.

EML 6154: Conduction Heat Transfer (3) *Prereq: MAP 2302, EML 4141.* Heat conduction in homogeneous, heterogeneous, isotropic, anisotropic, stationary, and moving bodies; in Cartesian, cylindrical and spherical systems. Examines exact and approximate solutions.

EML 6155: Convective Heat Transfer I (3) *Prereq: EML 4702, 4141.* Applying equations of motion and energy to forced and free convection with laminar and turbulent flow. Solution techniques to include simplification to ordinary differential equations, boundary layer approximations, similarity transformations, and integral approximations. Phenomenological treatment of turbulent transport.

EML 6156: Multiphase Convection Heat Transfer (3) *Prereq: EML 6155.* Detailed coverage of advanced convection heat transfer topics: boiling and condensation, high-velocity convection, transpiration cooling, convection around bodies, free jet flow, oscillating fluids, and microelectronic cooling.

EML 6157: Radiation Heat Transfer (3) *Prereq: MAP 2302, EML 4141.* Theory and analysis of radiation exchange in transparent and absorbing, and emitting and scattering media.

EML 6216: Analytical Dynamics II (3) *Prereq: EML 5215 or consent of instructor.* Continuation of Analytical Dynamics I. Vector and analytical dynamics in three dimensions. Rotational kinematics, particle and rigid-body motion, moments of inertia. Comparing Lagrangian techniques with the vector methods of Euler and Newton; vibrations, Euler's angles, gyroscope motion, and axially symmetric bodies.

EML 6267: Structural Dynamics of Production Machinery (3) Reviews mechanical vibrations with two degrees of freedom. Natural and forced vibrations of multi-degree-of-freedom systems. Experimental and computational modal analysis and synthesis. Vibrations of machine tools, rolling mills, robots.

EML 6278: Advanced Rotor Dynamics (3) *Prereq: EML 4220 and consent of instructor.* Analyzing dynamic stability, critical speeds, and unbalance response of rotor-bearing systems. Special problems encountered in modern applications operating through and above the critical speeds.

EML 6281: Geometry of Mechanisms and Robots I (3)

Developing applications to basic theory of the mathematics required to design spatial mechanisms and robot arms. Examples include mathematical description of the elements of mechanisms and robot arms (namely linkages and joints); their mobility and their analysis.

EML 6282: Geometry of Mechanisms and Robots II (3) Applying the theory of screws to determine stationary and uncertainty configurations of mechanisms and robot arms. Dexterity and workspace of robot arms.

EML 6324: Fundamentals of Production Engineering (3) Fundamentals of metal cutting, metal forming, and welding. Accuracy and rigidity of machine tools. Automation, numerical control, adaptive control.

EML 6417: Solar Energy Utilization (3; max: 6) Solar energy; its characteristics and availability; collection and storage; conversion and use as heat, refrigeration, thermal electric and power, photovoltaic conversion; and other applications.

EML 6451: Energy Conversion (3) Converting available forms of energy into mechanical and electrical forms; energy conversion schemes, including conventional cycles in unusual environments. MHD, photovoltaics, thermionic and thermoelectric conversion and fuel cells.

EML 6597: Mechanics of Gait (3) *Prereq: EML 5595.* Concepts, nomenclature, and control mechanics of normal and pathological bipedal gait.

EML 6606: Advanced Air Conditioning (3) *Prereq: EML 4600.* Air-conditioning system selection and system design; air-handling techniques including noise control, cleaning, and temperature and humidity control; modern technological development and economic analysis.

EML 6905: Individual Projects in Mechanical Engineering (1-3; max: 9)

EML 6934: Special Topics in Mechanical Engineering (1-4; max: 12)

EML 6936: Nonthesis Project (1-4; max: 6) An in-depth project for graduate students not pursuing a thesis master's degree. S/U.

EML 6971: Research for Master's Thesis (1-15) S/U.

EML 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

EML 7980: Research for Doctoral Dissertation (1-15) S/U.

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Medical Sciences

College of Medicine

Dean: M. L. Good. *Associate Dean for Graduate Education:* W. T. McCormack. *Complete faculty listing by department*: Follow this link

The College of Medicine offers training opportunities leading to either the Doctor of Philosophy or Master of Science degree in medical sciences. Minimum requirements for these degrees are given in the *General Information* section of this catalog. The interdisciplinary program (IDP) in medical sciences is the major focus leading to the Doctor of Philosophy degree. Other graduate courses and programs are listed under departmental headings.

Interdisciplinary Program (IDP) in Medical Sciences

The goal of the IDP is to prepare students for a diversity of careers in research and teaching in academic and commercial settings. The program provides a modern, comprehensive graduate education in biomedical sciences while providing both maximum program flexibility and appropriate specialization for advanced training. The IDP represents a cooperative effort of six interdisciplinary advanced concentrations with participation of over 250 faculty members.

During the first year of study, students undertake a common, comprehensive interdisciplinary core curriculum of classroom study, an extensive practical laboratory experience, and a responsible conduct of research course. In addition, they participate in several laboratory rotations in any of the laboratories of the College of Medicine faculty members. The advanced concentration and the supervisory committee chair are chosen after completion of the core

curriculum, to maximize flexibility and facilitate an informal decision. Students entering the advanced concentrations will take more specialized courses that strengthen their knowledge of these disciplines. The advanced concentration curricula are flexible enough to allow students to integrate course work offered in other advanced concentrations. In addition, journal clubs and seminars associated with their research interests allow students to further augment their scientific development.

Prospective students should have strong backgrounds in biology, chemistry (organic, quantitative, and physical), physics, and calculus. Demonstrated high motivation and a serious intention to pursue research-related careers are also important considerations. For more information, write IDP, P.O. Box 100215, College of Medicine, Gainesville, FL 32610-0215. For expanded information about the IDP, visit http://idp.med.ufl.edu.

Advanced Concentration in Biochemistry and Molecular Biology

Graduate Faculty

Director: S. C. Frost. *Complete faculty listing by department*: Follow this link

The Graduate Faculty of the biochemistry and molecular biology advanced concentration share an interest in the relationships between the structure of a biological macromolecule and the function of that molecule in the cell. The structure (encoded ultimately by the genome) sets the phenotype of the organism. The uniting theme among the Graduate Faculty is their approach to research: Each uses the techniques of biochemistry and molecular biology/genetics to characterize the function of a macromolecule and show how function (and the process it is part of) is determined by the structure of that molecule and its interactions with other macromolecules. Specific research directions range from physical determination of the molecular structure of proteins to regulation of cellular processes to the genetic mapping of disease loci. For information about other programs and courses in this field, see the Department of Biochemistry and Molecular Biology listing.

BCH 6107: Biophysical Techniques in Proteomics and Protein Science (1) *Prereq: GMS 6001 or consent of instructor. Coreq: BCH 6740 or consent of instructor.* Theory and application of modern biophysical techniques relevant to proteomics and protein science.
BCH 6206: Advanced Metabolism (3) *Prereq: BCH 4024, CHM 4207, or consent of instructor. One of three core biochemistry courses.* Reactions of intermediary metabolism, emphasizing their integrations, mechanisms, and control. Extensive examples from current literature.
BCH 6207: Advanced Metabolism: Role of Membranes in Signal Transduction and Metabolic Control (1) *Prereq: BCH 3025,*

4024, CHM 3218, 4207, GMS 6001, or consent of instructor. Fundamentals of membrane biochemistry. Discussions of membrane structure, nutrient and ion transport, protein targeting, and signal transduction. Experimental methods and techniques used to gather and analyze data related to membrane biochemistry and its regulation.

BCH 6208: Advanced Metabolism: Regulation of Key Reactions in Carbohydrate and Lipid Metabolism (1) *Prereq: BCH 3025, 4024, CHM 3218, 4207, GMS 6001, or consent of instructor.* Key reactions in metabolic pathways of carbohydrate and lipid metabolism. Explores the experimental basis for current understanding of these processes. Understanding the interactions between major metabolic pathways and control of these pathways under different physiological conditions.

BCH 6209: Advanced Metabolism: Regulation of Key Reactions in Amino Acid and Nucleotide Metabolism (1) *Prereq: BCH 3025, 4024, CHM 3218, 4207, GMS 6001, or consent of instructor.* Understanding interactions among major metabolic pathways and control of these pathways under different physiological conditions. Structural basis of enzyme function and regulation.

BCH 6296: Advanced Topics in Metabolic Control(1; max: 6) *Coreq: BCH 6206 or consent of instructor.* Thermodynamic, allosteric, hormonal, and genetic control of metabolic reactions.

BCH 6415: Advanced Molecular and Cell Biology (3) *Prereq: BCH 4024, CHM 4207, MCB 4303, or consent of instructor. PCB 3063 or a similar course in genetics recommended. One of three core biochemistry courses.* Molecular biology of pro- and eukaryotic organisms. Emphasizes understanding the experimental approaches that led to recent developments. Chromosome structure and organization, advances in recombinant DNA technology, DNA replication, RNA transcription and protein synthesis, and selected aspects of molecular regulation of gene expression.

BCH 6740: Physical Biochemistry/Structural Biology (3) *Prereq: BCH 4024, CHM 4207, or consent of instructor. Course in physical chemistry recommended. One of three core biochemistry courses.* Physical chemistry of biological molecules and techniques to study their properties. Approaches to structure determination.

BCH 6741C: Magnetic Resonance Imaging and Spectroscopy in Living Systems (1-3; max: 3) *Prereq: BCH 6740 or equivalent or consent of instructor.* MR imaging methods used to study the structure of cells, tissues, and whole animals. MR spectroscopy methods for monitoring biochemistry in living animals. Preparing samples, operating the instruments, and analyzing the data.

BCH 6744: Molecular Structure Determination by X-ray Crystallography (1; max: 2) *Prereq: BCH 6740 or equivalent or consent of instructor.* Detailed theoretical and practical instruction on technique of x-ray crystallography used for three-dimensional structure determination of macromolecules in studies aimed at structure-function elucidation.

BCH 6745: Molecular Structure and Dynamics of NMR Spectroscopy(1; max: 2) *Prereq: BCH 6740 or equivalent or*

consent of instructor. Theoretical and practical introduction to macromolecular NMR spectroscopy. Basics of multidimensional NMR for structure and dynamics measurements. Hands-on training in modern NMR.

BCH 6746: Structural Biology: Macromolecular Structure Determination (1; max: 3) *Prereq: BCH 3025, 4024, CHM 3218, 4207, GMS 6001 or consent of instructor.* Experimental approaches to biological macromolecular structure determination. Emphasizes current understanding of protein-protein and protein-nucleic acid structure motifs.

BCH 6747: Structural Biology / Advanced Physical Biochemistry: Spectroscopy and Hydrodynamics (1) *Prereq: BCH 3025, 4024, CHM 3218, 4207, GMS 6001, or consent of instructor.* Applying spectroscopic techniques (circular dichroism, fluorescence, nuclear magnetic resonance) to determine the structure of biological macromolecules. Hydrodynamic approaches including light scattering, molecular diffusion, viscosity, and ultracentrifugation.

BCH 6749C: Numerical Methods in Structural Biology(1) *Prereq: BCH 6740 or equivalent or consent of instructor.* Introduction to mathematical and computational methods needed to understand current structural models, biophysical processes, data acquisition methods, and analysis of data acquired with current techniques.

BCH 6876: Recent Advances in Membrane Biology (1) *Prereq: general biochemistry or consent of instructor.* Literature presented by students and faculty, discussed in depth. Emphasizes current developments, data, interpretation, and critical analysis. S/U.

BCH 6877: Recent Advances in Structural Biology (1; max: 8) *Prereq: general biochemistry or consent of instructor.* Literature on structural biology presented by students and faculty, discussed in depth. Current developments, data interpretation, and critical analysis. S/U.

BCH 6878: Recent Advances in Cytoskeletal Processes (1; max: 8) *Prereq: general biochemistry or consent of instructor.* Literature on cytoskeletal processes presented by students and faculty, discussed in depth. Current developments, data interpretation, and critical analysis. S/U.

BCH 6936: Biochemistry Seminar (1; max: 20) *Prereq: required of graduate students in biochemistry; open to others by special arrangement.* Research reports and discussions of current research literature given by graduate students, departmental faculty, and invited speakers.

BCH 7410: Advanced Gene Regulation (1; max: 3) *Prereq: GMS 6001 or consent of instructor.* Literature-based assessment of the most recent advances in factors governing eukaryotic gene regulation.

BCH 7412: Epigenetics of Human Disease and Development(1) *Prereq: GMS 6001. BCH 6415 recommended.* In-depth assessment of epigenetic mechanisms of mammalian gene regulation: DNA methylation, histone modifications, genomic imprinting, inherited

genetic diseases, viral gene regulation, and epigenetic reprogramming in embryonic stem cells and cloning.
BCH 7515: Structural Biology / Advanced Physical Biochemistry: Kinetics and Thermodynamics (1) *Prereq: BCH 4024, CHM 3218, 4207, GMS 6001, or consent of instructor.* Fundamentals of chemical kinetics and thermodynamic analysis of equilibria. Emphasizes applying this knowledge to understand basic enzyme kinetics, pulse-chase kinetics, protein polymerization, DNA dynamics, protein-nucleic acid interactions, and cooperative ligand binding.
GMS 6195: Epigenetics Journal Club (1; max: 12) *Prereq: consent of instructor.* Presentation and critical discussions of recent original papers published in high-impact journals relating to the topic of epigenetics. S/U.

Advanced Concentration in Genetics

Directors: H. V. Baker and M. R. Wallace. *Complete faculty listing by department*: Follow this link

The concentration in genetics offers graduate training in all facets of modern molecular genetics including bacterial, viral, lower eukaryotic, mouse, developmental, and human genetics. The courses listed are taught in a 5-week modular format.

BCH 7410: Advanced Gene Regulation (1; max: 3) *Prereq: GMS 6001 or consent of instructor.* Literature-based assessment of the most recent advances in factors governing eukaryotic gene regulation.
GMS 6010: Yeast Genetics (1; max: 3) *Prereq: GMS 6001 or consent of instructor.* Using the yeast *Saccharomyces cerevisiae*, as a model eukaryotic cell to study the biological processes common to all eukaryotic organisms.
GMS 6011: Mouse Genetics (1; max: 3) *Prereq: GMS 6001 or consent of instructor.* Theoretical framework for understanding the fundamentals of mouse genetics and use of the mouse model to study human disease. Advanced technical tools used for research and their application to novel problems.
GMS 6012: Human Genetics (1; max: 3) *Prereq: GMS 6001 or consent of instructor.* Theoretical framework for understanding the fundamentals of human genetics. Advanced technical tools used for research.
GMS 6013: Developmental Genetics (1; max: 3) *Prereq: GMS 6001 or consent of instructor.* Theoretical framework for understanding the fundamentals of developmental genetics. Advantages and limitations of several model systems and their application to the study of development.
GMS 6014: Applications of Bioinformatics to Genetics (1) *Prereq: GMS 6001; consent of instructor.* Storage, retrieval, and analysis of information related to genetics.
GMS 6015: Human Genetics II (1) *Prereq: GMS 6012; consent of*

instructor. Theoretical framework, emphasizing functional genomics and bioinformatics. Advanced technical tools used for research and development in these areas.

GMS 6034: Advanced Virology I: Genetics and RNA (1) *Prereq: consent of instructor.* Theoretical framework for understanding the fundamental concepts of viral genetics. Methods of analysis used to elucidate the mechanisms of virus reproduction.

GMS 6038: Bacterial Genetics and Physiology (1) *Prereq: GMS 6006 or consent of instructor.* Theoretical framework for understanding fundamental concepts.

GMS 6059: Gene Therapy from Bench to Bedside (1) *Prereq: GMS 6034, 6035, and 6036 or consent of instructor.* Designing and using gene transfer vectors to treat various diseases. Understanding the practical successes and hurdles of gene therapy.

GMS 6151: Genetic Analysis Using Model Systems (1) *Prereq: GMS 6001 or consent of instructor.* Major model systems used in scientific research.

GMS 6153: Advanced Bacterial Genetics (2) *Prereq: GMS 6038 and consent of instructor.* Advanced principles of bacterial genetics, emphasizing work with bacteria and genetic constructs as tools in biotechnologies.

GMS 6155: DNA Microarray Data Analysis (1) *Prereq: GMS 6014 or consent of instructor.* Hands-on study of microarray data analysis and relational databases.

GMS 6181: Special Topics in Microbiology (1-6; max: 18)

GMS 6195: Epigenetics Journal Club (1; max: 12) *Prereq: consent of instructor.* Presentation and critical discussions of recent original papers published in high-impact journals relating to the topic of epigenetics. S/U.

GMS 6231: Genomics and Bioinformatics (3) *Prereq: STA 6166 and PCB 5065 or consent of instructor.* Principles of genomic characterization and bioinformatic analysis of eukaryotes.

GMS 6232: Advanced Applications of Bioinformatics in Genetics (1; max: 12) *Prereq: GMS 6014 or consent of instructor; programming experience.* Applying bioinformatics and computational approaches to solve research problems.

GMS 6290: Genetics/Genomics Program Graduate Seminar (1) *Prereq: enrolled in campus-wide genetics and genomics program or consent of instructor.* Presentations, seminars, and critical discussions of recent original research relating to genetics and genomics.

GMS 6506: Biologic Drug Development (1) Explores the manufacturing and testing of biomedical products, quality control, quality assurance responsibilities, and regulatory compliance, providing practical understanding of the successes and hurdles that are faced in biopharmaceutical product development today.

GMS 6920: Genetics Journal Colloquy (1; max: 12) *Prereq: consent of instructor.* Critical presentations and discussions of recent original articles. S/U.

GMS 7192: Journal Colloquy (1; max: 12) Critical presentations and discussions of recent original articles. S/U.

Advanced Concentration in Immunology and Microbiology

Graduate Faculty

Directors: P. A. Gulig and L. Morel. *Complete faculty listing by department*: Follow this link

The concentration in immunology and microbiology offers graduate training in cellular and molecular immunology (including immunopathology, immunogenetics, and autoimmunity) and in microbiology (including virology, bacteriology, microbial genetics, and microbial pathogenesis). The courses listed are taught in a 5-week modular format.

GMS 6030: Autoimmunity (1; max: 3) *Prereq: GMS 6006 or consent of instructor.* Biological and biochemical aspects of immunology, focusing on molecular and cellular events involved in genetic susceptibility, pathogenesis, and treatment of human autoimmune diseases.
GMS 6031: Molecular Immunology (1) *Prereq: GMS 6001, 6006, or consent of instructor.* Biological and biochemical aspects, focusing on molecular events critical to development of an immune response.
GMS 6032: Mechanisms of Host Defense (1) *Prereq: GMS 6001, 6006, or consent of instructor.* Biological and biochemical aspects of immunology, focusing on effector mechanisms of immune response to microbes and macromolecules.
GMS 6033: Immunity in Health and Disease (1) *Prereq: GMS 6001, 6006, or consent of instructor.* Biological and biochemical aspects of immunology, focusing on the molecular and cellular basis of human disease.
GMS 6034: Advanced Virology I: Genetics and RNA (1) *Prereq: consent of instructor.* Theoretical framework for understanding the fundamental concepts of viral genetics. Methods of analysis used to elucidate the mechanisms of virus reproduction.
GMS 6035: Advanced Virology II: RNA Viruses (1) *Prereq: consent of instructor.* Molecular biology and genetics of virology, focusing on the molecular biology of RNA viruses.
GMS 6036: Molecular Virology III: DNA Viruses (1) *Prereq: consent of instructor.* Molecular biology and genetics of virology, focusing on replication and pathogenesis of DNA viruses.
GMS 6038: Bacterial Genetics and Physiology (1) *Prereq: GMS 6006 or consent of instructor.* Theoretical framework for understanding fundamental concepts.
GMS 6039: Bacterial Pathogenesis (1) *Prereq: consent of instructor.* Survey of medical microbiology, focusing on the genetics and physiology of bacteria, their use as research tools, and the role of bacteria in causing disease.
GMS 6040: Host-Pathogen Interactions (1) *Prereq: consent of instructor.* Survey of medical microbiology, focusing on the host response and subsequent evasion of that response by pathogens.
GMS 6121: Infectious Diseases (3) *Prereq: consent of instructor.*

Survey of medical microbiology directed at understanding infectious disease in terms of molecular pathogenesis, bacterial physiology, and genetics.

GMS 6140: Principles of Immunology (3) *Prereq: GMS 6001 or consent of instructor.* Biological and biochemical aspects of host resistance and immunity. Chemical and physiochemical properties of the proteins of immune reactions.

GMS 6145: Immunology of Gene Transfer (1) *Prereq: background in molecular biology, virology, and immunology.* Immunological aspects of gene therapy.

GMS 6153: Advanced Bacterial Genetics (2) *Prereq: GMS 6038 and consent of instructor.* Advanced principles of bacterial genetics, emphasizing work with bacteria and genetic constructs as tools in biotechnologies.

GMS 6181: Special Topics in Microbiology (1-6; max: 18)

GMS 6193: Research Conference in Oral Biology (1 or 3; max: 8) *Required of graduate students in oral biology; open to others by departmental approval.* Critical discussion and appraisal of current research in the department by students and faculty. S/U.

GMS 6196: Virology Journal Club (1; max: 12) Presentation and critical discussions of recent original articles in the virology literature.

GMS 6337: B Cell Development in Health and Disease (1; max: 15) *Prereq: GMS 6031, 6032, and 6033 or equivalent. Strong background in immunology.* Advanced understanding of the role and regulation of B cells, emphasizing dysregulation of B cell functions in autoimmune diseases.

GMS 6381: Special Topics in Pathology (1-4; max: 12) *Prereq: departmental approval.* Conference and supervised laboratory work. Topics selected to meet each student's needs. Offered in even-numbered years.

GMS 6382: Special Topics in Immunology (1-3; max:6) *Prereq: GMS 6140 or consent of instructor.* Analysis and discussion of contemporary topics in development of current concepts. Evaluation of the most recently published research literature. Seminars and discussions with invited speakers.

GMS 6921: Immunology/Microbiology Journal Colloquy (1; max: 12) *Prereq: GMS 6001, 6006, or consent of instructor.* Critical presentations and discussions of recent original articles.

GMS 7192: Journal Colloquy (1; max: 12) Critical presentations and discussions of recent original articles. S/U.

VME 6934: Topics in Veterinary Medical Sciences (1-4; max: 10) *Prereq: consent of instructor.* Studies in topics involving new developments and/or research techniques in veterinary medical sciences.

Advanced Concentration in Molecular Cell Biology

Graduate Faculty

Director: S. Sugrue. *Complete faculty listing by department*: Follow this link

The advanced concentration in molecular cell biology (MCB) prepares investigators for careers in biomedical research in academic or industrial settings. This multidisciplinary specialization has more than 50 participating faculty members and offers an extraordinary range of opportunities for advanced study of life at the molecular and cellular levels. The Graduate Faculty share common interests in the molecular interactions that account for functionally integrated subcellular, cellular, and tissue organization found in living organisms. The model systems in use range from yeast and cellular lime molds through *Drosophila* to birds and mammals. These systems are manipulated and analyzed using a wide range of powerful molecular, genetic, protein chemical, immunological, pharmacological, nuclear magnetic resonance (NMR), and microscopic imaging strategies. Students who select MCB take advanced course work and initiate independent research during the second year. This approach provides broad-based vision early in the program and the appropriate degree of specialization later on.

GMS 5905: Special Topics in Biomedical Sciences(1-4; max: 4) Analysis and discussion of contemporary topics and the development of biomedical sciences.
GMS 6013: Developmental Genetics (1; max: 3) *Prereq: GMS 6001 or consent of instructor.* Theoretical framework for understanding the fundamentals of developmental genetics. Advantages and limitations of several model systems and their application to the study of development.
GMS 6061: Nuclear Structure and Dynamics (1) *Prereq: GMS 6001 or consent of instructor.* Cell biology of the nucleus. Offered in odd-numbered years.
GMS 6062: Protein Trafficking (1) *Prereq: GMS 6001 or consent of instructor.* Movement of proteins in cell. Offered in even-numbered years.
GMS 6063: Mechanisms of Aging (1) *Prereq: GMS 6001 or consent of instructor.* Recent developments in the field of aging.
GMS 6064: Tumor Biology (1) *Prereq: GMS 6001 or consent of instructor.* Current understanding of the molecular basis of cancer. Offered in odd-numbered years.
GMS 6065: Fundamentals of Cancer Biology (2) *Prereq: GMS 6001 or consent of instructor.* Broad-based introduction into causes of cancer, molecular and biological processes involved in malignancies, and current cancer treatment approaches.
GMS 6331: Stem Cell Biology(1) *Prereq: GMS 6001 or consent of instructor.* Recent progress in mammalian stem cell research.
GMS 6335: Advanced Stem Cell Biology: Tissue Engineering (1) *Prereq: GMS 6331 and GMS 6336* Current state of the art in using stem cells and other technologies to engineer tissues and organs for therapeutic use.
GMS 6336: Advanced Stem Cell Biology: Regenerative Medicine (1) *Prereq: GMS 6331.* Potential clinical applications of tissue-specific, adult stem cells; derivation, manipulation, uses, and

limitations.
GMS 6381: Special Topics in Pathology (1-4; max: 12) *Prereq: departmental approval.* Conference and supervised laboratory work. Topics selected to meet each student's needs. Offered in even-numbered years.
GMS 6635: Organization of Cells and Tissues (2) *Prereq: GMS 6001 or consent of instructor.* Structural and functional aspects.
GMS 6642: Morphogenesis: Organ Systems I (2) *Prereq: GMS 6635, second-year IDP student.* Skin, respiratory, lymphatics, and special sense.
GMS 6643: Morphogenesis: Organ Systems II (2) *Prereq: GMS 6642, second-year IDP student.* GI, kidney, endocrine, male and female reproduction.
GMS 6644: Apoptosis (1) *Prereq: GMS 6001 or consent of instructor.* Modern view of the molecular mechanisms of tumor development. Offered in even-numbered years.
GMS 6647: Transcriptional and Translational Control of Cell Growth and Proliferation (1) *Prereq: GMS 6001 or consent of instructor.* The role of transcription and translation in controlling gene expression regulating cell growth and proliferation.
GMS 6690: Molecular Cell Biology Journal Club (1; max: 12) Faculty-student discussion of research papers and topics.

Advanced Concentration in Neuroscience

Graduate Faculty

Director: S. L. Semple-Rowland.*Complete faculty listing by department*: Follow this link

The Graduate Faculty associated with the neuroscience advanced concentration have expertise in neuroanatomy, molecular and cellular neurobiology, neurodevelopment and aging, neurotransmitter chemistry and pharmacology, neuroendocrinology and immunology, cellular and molecular neuro-oncology, cellular and membrane neurophysiology, somatosensory and motor systems, transplantation neurobiology, injury and repair of the CNS, and neurobehavioral sciences. Study in marine vertebrate and invertebrate neurobiology is available through Graduate Faculty at the Whitney Laboratory.

GMS 6021: Principles of Neuroscience I: Organization and Development of the Nervous System (2) *Prereq: GMS 6001 or consent of instructor.* Principles governing neural development and plasticity of the vertebrate central nervous system.
GMS 6022: Principles of Neuroscience II: Cellular and Molecular Neuroscience (2) *Prereq: GMS 6001 or consent of instructor.* Principles governing intercellular communication within the nervous system.
GMS 6023: Principles of Neuroscience III: Neural Integration and Control (2) *Prereq: GMS 6001 or consent of instructor.* Principles governing the integration and control of information

processing within the central nervous system.

GMS 6029: Brain Journal Club (1; max: 12) *Prereq: consent of instructor.* Opportunities to present and participate in discussions of top-tier research papers in the neurosciences. S/U.

GMS 6051: Signal Transduction (1) *Prereq: GMS 6001 or consent of instructor.* Focuses on the mechanisms underlying cellular signal transduction.

GMS 6052: Ion Channels of Excitable Membranes (1) *Prereq: consent of instructor.* Examines the background of ion channel proteins that regulate and respond to cell membrane potential. A cell's membrane potential is an important source of energy for regulating intracellular ion concentration, controlling the secretory process, and for electrical signaling in the nervous system.

GMS 6072: Neuroendocrinology and Neuroimmunology (1) *Prereq: GMS 6007 or consent of instructor.* Cellular and molecular mechanisms regulating interactions among the immune, endocrine, and nervous systems.

GMS 6073: Developmental Neurobiology (1) *Prereq: GMS 6007 or consent of instructor.* Focuses on current research that is being conducted to build on an understanding of how the nervous system develops. Examines both cellular and molecular perspectives.

GMS 6074: Comparative and Evolutionary Neurobiology (3) *Prereq: GMS 6007 or consent of instructor.* Broad perspective of nervous system evolution, structure, and function in different species. Comparisons of cytoarchitectural principles that produce mammalian nervous systems are additional focus.

GMS 6078: Synaptic Function and Plasticity (1) *Prereq: consent of instructor.* Synapses that mediate fast electrical excitation and inhibition in the mammalian brain and how these synapses change with development and experience. Molecular biology of glutamate, GABA, and nicotinic acetylcholine receptor subtypes, experimental paradigms for studying long-lasting changes in synaptic function, and changes in animal behavior related to neuroplastic events.

GMS 6079: Computers in Biology (1) *Prereq: GMS 6001 or consent of instructor.* Students will be introduced to the use of computers in studies of protein and nucleic acid sequences and cellular function.

GMS 6080: Basic Magnetic Resonance Imaging (1) *Prereq: GMS 6007 or consent of instructor.* Principles behind nuclear magnetic resonance imaging (MRI) and spectroscopy (MRS) and how these methods are applied to studies of the human brain.

GMS 6592: Ion Channels Journal Club: Pharmacology, Biophysics, and Neuroscience of Excitable Membranes (1) *Prereq: consent of instructor.* Recent papers in the context of larger issues in therapeutics and neuroscience. Discussions led by students and faculty. S/U.

GMS 6705: Functional Human Neuroanatomy (4) *Prereq: consent of instructor.* Intensive introduction to the anatomy, function, and dysfunction of the human central nervous system.

GMS 6709: Current Topics in Vision (1) *Prereq: GMS 6001 or consent of instructor.* Genetics, molecular biology, and biochemistry

underlying vision and the diseases that affect this important human sense.

GMS 6711: Neurobiology of Pain (1) *Prereq: GMS 6001 or consent of instructor.* Overview of neurobiological processes involved in pain, including methods of investigating pain processing in humans and other animals.

GMS 6750: Molecular Pathobiology of Neural Disease (1) *Prereq: consent of instructor.* Overview of a broad range of neural disorders emphasizing genetically determined conditions.

GMS 6760: Comparative Biology of Cell Signaling (2) *Prereq: GMS 6001 or consent of coordinator.* Overview of the principles governing cellular and molecular signaling in the nervous system. Introduction to novel experimental approaches and non-mammalian preparations used to explore these principles.

GMS 6791: Visual Neuroscience Journal Club (1; max: 2) *Prereq: 1st-year IDP core course; or consent of instructor.* Presentation and discussion of cutting-edge research papers. S/U.

GMS 7706C: Medical Neuroscience (4) Anatomy, physiology, function, and dysfunction of the human central nervous system. Offered spring term.

GMS 7794: Neuroscience Seminar (1; max: 12) Research seminars given by local, national, and occasionally international speakers. S/U.

GMS 7795: Special Topics in Neuroscience (1-4; max: 12) Specialized subjects in the neurosciences and allied disciplines. Current topics include biological imaging techniques, fundamentals of computational neuroscience, graduate research seminar series, write clubs, scientific communication workshop (Whitney Lab), and electrophysiological journal club (Whitney Lab).

Advanced Concentration in Physiology and Pharmacology

Graduate Faculty

Director: J. K. Harrison. *Complete faculty listing by department*: Follow this link

The Graduate Faculty associated with this advanced concentration have expertise in a variety of disciplines, including molecular and cellular biology, pharmacology, physiology, neuroscience, and biochemistry. These faculty bring together unique strengths to provide the students with diverse training. Students may train in laboratories involved in cardiovascular, neuro, endocrine, and developmental physiology; pharmacology; and toxicology. Students conduct research at the molecular, cellular, and integrative levels. Many of the faculty are involved in multidisciplinary, collaborative research efforts that aim to understand basic physiological mechanisms and pathophysiological processes (e.g., cardiovascular, neurodegenerative, and neoplastic diseases).

GMS 6051: Signal Transduction (1) *Prereq: GMS 6001 or consent of instructor.* Focuses on the mechanisms underlying cellular signal

transduction.

GMS 6052: Ion Channels of Excitable Membranes (1) *Prereq: consent of instructor.* Examines the background of ion channel proteins that regulate and respond to cell membrane potential. A cell's membrane potential is an important source of energy for regulating intracellular ion concentration, controlling the secretory process, and for electrical signaling in the nervous system.

GMS 6053: Cancer Biology and Therapeutics (1) *Prereq: GMS 6065 or consent of instructor.* Integrated approach for teaching of pharmacology and physiology pertaining to cancer.

GMS 6400C: Principles of Physiology (6) *Prereq: consent of instructor.* Physiology of mammalian organ systems, with special reference to the human.

GMS 6405: Fundamentals of Endocrine Physiology (1) *Prereq: GMS 6001 or consent of instructor. For 1st- and 2nd-year graduate students.* Human body endocrine system physiology.

GMS 6406: Fundamentals of Pulmonary/Respiratory Physiology (1) *Prereq: GMS 6001 or consent of instructor.* Human body pulmonary/respiratory system physiology.

GMS 6408: Fundamentals of Renal Physiology (1) *Prereq: GMS 6001 or consent of instructor.* Human body gastrointestinal system physiology.

GMS 6410: Physiology of the Circulation of Blood (2) Physiology of the component parts of the circulation. The relation of structure and function. Emphasizes control mechanisms.

GMS 6411: Fundamentals of Cardiovascular Physiology (1) *Prereq: GMS 6001 or consent of instructor.* Human body cardiovascular system physiology.

GMS 6415: Fundamentals of Gastrointestinal Physiology (1) *Prereq: GMS 6001 or consent of instructor.* Gastrointestinal system of human body.

GMS 6491: Journal Club in Physiology(1; max: 12) Timely research papers in all areas of physiology; namely, cellular physiology, molecular physiology, and functional genomics. S/U.

GMS 6563: Molecular Pharmacology (1; max: 3) *Prereq: GMS 6009 or consent of instructor.* Biochemical approach to the actions of drugs, stressing analysis of drug-receptor interactions, structure-activity relationships, kinetics of distribution of drugs, and metabolism of foreign compounds.

GMS 6590: Seminar in Pharmacology (1; max: 15) *Prereq: GMS 6500.* Research reports and discussions of current research literature by graduate students, faculty, and invited lecturers.

GMS 6592: Ion Channels Journal Club: Pharmacology, Biophysics, and Neuroscience of Excitable Membranes (1) *Prereq: consent of instructor.* Recent papers in the context of larger issues in therapeutics and neuroscience. Discussions led by students and faculty. S/U.

GMS 6735: Neuropharmacology (1; max: 3) *Prereq: GMS 6007, 6009, or consent of instructor.* Identification, synthesis, metabolism, and pharmacology of neurotransmitters and their receptors. Includes biogenic amines, neuropeptides, and other nervous system

transmitters.
GMS 7593: Topics in Pharmacology and Toxicology (1-3; max: 12) Seminars, informal conferences, or laboratory work on selected topics.

Core Courses--IDP

GMS 6001: Fundamentals of Biomedical Sciences I (5) *Prereq: consent of instructor.* Integrated approach to cellular, molecular, biochemical, and genetic aspects of cell function.
GMS 6003: Fundamentals of Graduate Research and Professional Development (1; max: 2) *Prereq: consent of instructor. Designed for new graduate students. Coreq: GMS 6001.* Practical knowledge and understanding of issues to increase chances for a successful graduate education and professional career in biomedical sciences. S/U.
GMS 6004: IDP Practical Laboratory (2) Five weeks of laboratory instruction complemented with supporting theoretical lectures and workshops on radiation safety, biosafety, and library resources. Practical laboratory experience in proteins and nucleic acids, including DNA cloning, PCR, Southern blotting, protein purification and characterization, and RNA methods for cDNA cloning.
GMS 6005: Fundamentals of Developmental Biology (2) *Prereq: GMS 6001 or consent of instructor. Designed for first-year graduate students.* Integrated overview of mechanistic principles of development deriving from experimental analysis of nematode worm, fruit fly, chick, and mouse.
GMS 6006: Fundamentals of Immunology and Microbiology (1) *Prereq: GMS 6001 or consent of instructor. Designed for first-year graduate students.* Integrated approach to immunology, microbiology, and immune response to infection.
GMS 6007: Fundamentals of Neuroscience (2) *Prereq: GMS 6001 or consent of instructor. Designed for first-year graduate students.* Fundamental concepts on development, structure, function, and plasticity of nervous system.
GMS 6008: Fundamentals of Physiology and Functional Genomics (2) *Prereq: GMS 6001 or consent of instructor. Designed for first-year graduate students.* Fundamental physiological concepts. Emphasizes the impact of functional genomics technology on contemporary physiology.
GMS 6009: Principles of Drug Action (1) *Prereq: GMS 6001 or consent of instructor. Designed for first-year graduate students.* Fundamental concepts of drug action, receptor structure and function, and pharmacokinetics.
GMS 6065: Fundamentals of Cancer Biology (2) *Prereq: GMS 6001 or consent of instructor.* Broad-based introduction into causes of cancer, molecular and biological processes involved in malignancies, and current cancer treatment approaches.
GMS 6090: Research in Medical Sciences (1-10; max: 10) Supervised research other than that for the thesis or dissertation in biochemistry and molecular biology, genetics, immunology and

microbiology, molecular cell biology, neuroscience, and physiology and pharmacology. S/U.

GMS 6901: Seminar in Biology of Disease (1; max: 8) Current advances in etiology and treatment of disease. S/U.

GMS 7003: Responsible Conduct of Biomedical Research (1) *Prereq: GMS 6001 or consent of instructor.* Key issues in the responsible conduct of biomedical research, following the research process from inception to planning, conducting, reporting, and reviewing biomedical research.

GMS 7593: Topics in Pharmacology and Toxicology (1-3; max: 12) Seminars, informal conferences, or laboratory work on selected topics.

General Courses

GMS 5905: Special Topics in Biomedical Sciences(1-4; max: 4) Analysis and discussion of contemporary topics and the development of biomedical sciences.

GMS 6090: Research in Medical Sciences (1-10; max: 10) Supervised research other than that for the thesis or dissertation in biochemistry and molecular biology, genetics, immunology and microbiology, molecular cell biology, neuroscience, and physiology and pharmacology. S/U.

GMS 6622: Mitochondrial Biology in Aging and Disease (2) Basic biology of mitochondria; mitochondria in aging and disease; assessments for mitochondrial function and genetic variance.

GMS 6872: Science and Ethics of in Vitro Fertilization (3) *Prereq: consent of instructor.* Scientific, practical, and ethical issues in establishing and operating a human in vitro fertilization laboratory.

GMS 6905: Independent Studies in Medical Sciences(1-10; max: 12)

GMS 6910: Supervised Research (1-5; max: 5) S/U.

GMS 6931: Ethical and Policy Issues in Clinical Research (2) Ethical and policy issues relating to conduct of clinical research. Basic understanding of regulations governing research on human subjects. Introduction to the topic of research with animals.

GMS 6940: Supervised Teaching (1-5; max: 5) S/U.

GMS 6971: Research for Master's Thesis (1-15) S/U.

GMS 7001: Fundamentals of Biomedical Science Education (2) *Prereq: consent of instructor.* Overview of educational issues faced by biomedical scientists teaching at the undergraduate, graduate, or professional level. Practical guidelines most relevant for beginning biomedical science educators, including teaching skills and strategies and the underlying theory of learning and teaching.

GMS 7002: Practicum in Biomedical Science Education (3) *Prereq: GMS 7001.* Teach biomedical science and/or biotechnology (supervised by a professor) at summer workshops for high school students and teachers. S/U.

GMS 7003: Responsible Conduct of Biomedical Research (1) *Prereq: GMS 6001 or consent of instructor.* Key issues in the

responsible conduct of biomedical research, following the research process from inception to planning, conducting, reporting, and reviewing biomedical research.

GMS 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

GMS 7980: Research for Doctoral Dissertation (1-15) S/U.

Other Interdisciplinary Doctoral Concentrations

Interdisciplinary study in **toxicology** is coordinated by the Center for Environmental and Human Toxicology and is concerned with the effects of chemicals on human and animal health. Additional information is given in the *Interdisciplinary Graduate Studies* section of this catalog or may be obtained from the codirector, Dr. Kathleen Shiverick, P.O. Box 100267, College of Medicine, Gainesville, FL 32610 or (352) 392-3545.

The interdisciplinary emphasis on **vision sciences** is also discussed in the *Interdisciplinary Graduate Studies* section. The program director is Dr. W. Clay Simith, P.O. Box 100284College of Medicine, Gainesville, FL 32610 or (352) 392-0476.

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Medicinal Chemistry

College of Pharmacy

Graduate Faculty

Chair: M. O. James. *Graduate Coordinator:* R. J. Bergeron, Jr.
Complete faculty listing by department: Follow this link

The College of Pharmacy offers the Doctor of Philosophy degree in pharmaceutical sciences with a concentration in medicinal chemistry. Medicinal chemistry is a unique blend of the physical and biological sciences. The scope of the field is sufficiently broad to give students with many different science backgrounds a rewarding and challenging program of study. Areas of active research include organic synthesis of medicinal agents, metal chelate design, prodrugs and topical drug delivery, drug metabolism, molecular toxicology, molecular biology, combinatorial chemistry, neurochemistry, analytical chemistry, molecular modeling, natural products, and drug discovery.

The applicant should have an undergraduate degree in pharmacy, chemistry, biology, or premedical sciences. A background in calculus and physical and organic chemistry is required. In addition to graduate medicinal chemistry courses in the College of Pharmacy, graduate courses in chemistry and biochemistry are required for the program.

The College also offers the Master of Science in Pharmacy degree in pharmaceutical sciences (nonthesis option) with concentrations in both forensic drug chemistry and forensic serology and DNA in a distance learning format. Minimum requirements for the M.S.P. and Ph.D. degrees are described in the *General Information* section of

this catalog.

The Department participates in the interdisciplinary concentration in toxicology. For more information, see the *Interdisciplinary Graduate Studies* section of this catalog.

PHA 5475: Synthesis of Prodrugs (3) *Prereq: introductory organic chemistry, medicinal chemistry, pharmaceutics.* An outline of synthetic and physical chemical approaches to solving drug delivery, bioavailability, activity, potency, toxicity, and acceptability problems.
PHA 6115: Equilibria, Complexations, and Interactions of Drugs (3) Models for drug interactions in solution. Physical chemistry characteristics of drugs and their complexes in pharmaceutical systems.
PHA 6354: Natural Medicinal Products(3) Chemistry of compounds derived from plants and animals.
PHA 6356: Structure Determination of Complex Natural Products (3) *Prereq: CHM 5235 or consent of instructor.* Rigorous structure determination of natural products, using modern spectroscopic methods. Become able to elucidate the structure of any organic small molecule.
PHA 6417: Pharmaceutical Analysis II (3) Absorption, fluorescence, phosphorescence, and spectroanalysis of drugs and related compounds.
PHA 6425: Drug Biotrans and Molecular Mechanisms of Toxicity (3) *Prereq: introductory organic chemistry, biochemistry.* Enzymology and mechanisms of drug biotransformation pathways. Examples of drugs and other xenobiotics that exhibit toxicity related to biotransformation.
PHA 6447: Drug Design (3) *Prereq: organic chemistry, biochemistry, pharmacology, or consent of instructor.* Relevant disciplines and their effect on new drug development, from discovery of a new active lead compound to final refinement as a commercial product.
PHA 6448: High Throughput Drug Discovery (2) *Prereq: organic chemistry, biochemistry, or consent of instructor.* Introduction to combinatorial chemistry, multi-compound based technologies, and their use in screening bioassays to discover lead compounds.
PHA 6471: Synthetic Medicinal Chemistry(3) Review of acid and base properties of pharmacologically active molecules. Review of mechanisms of synthetic reactions, and their applications.
PHA 6840: Medicinal Chemistry of Drugs of Abuse(3) Pharmacological effects of commonly encountered licit and illicit pharmaceutical compounds.
PHA 6851: Forensic Analysis of DNA(3) Techniques for isolation of DNA from cells. Spectroscopic techniques. Hydrodynamic and electrophoretic separation methods. Sequence determination. Statistical analysis and forensic significance.
PHA 6853: Biological Evidence and Serology(3) Overview of crime scene investigation as it pertains to biological evidence. Crime

scene safety. Collecting and preserving evidence. Identifying, analyzing, and interpreting biological stains.

PHA 6854: Forensic Immunology (3) Antibody formation, antigen structure. Complement mediated reactions. Hypersensitivity. Immunoelectrophoretic techniques in forensic science.

PHA 6855: Forensic Genetics (3) Principles of inheritance. Genetic polymorphisms and forensic implications, population genetics and paternity testing.

PHA 6856: Blood Spatter and Distribution (3) Blood spatter creation and interpretation. Recording, collection, and processing of bloodstains and blood spatter evidence.

PHA 6905C: Research Procedures in Medicinal Chemistry(1-4; max: 12)

PHA 6934: Seminar in Medicinal Chemistry (1; max: 3) Weekly presentation and discussion of research reports based on college programs or literature. S/U option.

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Microbiology and Cell Science

College of Agricultural and Life Sciences

Graduate Faculty

Chair: E. Triplett. *Graduate Coordinator:* K. T. Shanmugam. *Complete faculty listing by department*: Follow this link

Graduate study is offered leading to the Doctor of Philosophy degree in microbiology and cell science, with emphasis in one or more of the disciplines of biochemistry, cell biology, and microbiology.

Requirements for these degrees are provided in the *General Information* section of this catalog.

Instruction and guidance are collaborative among faculty in the Colleges of Agricultural and Life Sciences, Liberal Arts and Sciences, and Medicine.

Research spans broad areas in the cellular and molecular aspects of bacterial, plant, and animal life functions: Areas of research include microbial biochemistry, biotechnology; biomass conversion; genetic and metabolic regulation; environmental microbiology; cell biology; molecular biology; molecular genetics; genomics and bioinformatics; immunology; virology; parasitology, host-pathogen interactions; cellular ultrastructure.

Prerequisites for admission to graduate study, in addition to those of the Graduate School, are a broad educational background including mathematics, physics, and chemistry through organic,

analytical, and physical chemistry; basic courses in biology, botany, and/or zoology; and at least one course in microbiology and biochemistry. An undergraduate major in biochemistry, physical or chemical science, engineering, or general biology may be an acceptable alternative to a degree in microbiology or cell science. Receipt of an advanced degree requires detailed knowledge in microbiology, biochemistry, and chemistry; undergraduate deficiencies may necessitate additional course work prior to entry into the graduate program.

MCB 5252: Microbiology, Immunology, and Immunotherapeutics(4) *Prereq: CHM 2210, 2211, and consent of instructor.* Microbiology and immunology for pharmacy students. Microorganisms and infection, control with antimicrobials, host immune response, immune disorders.

MCB 5303L: Microbial Genetics and Biotechnology Laboratory (2) *Prereq: MCB 3023/3023L and 4303 or PCB 4522 with grade of C or higher.* Methods for mutagenesis, gene transfer and genetic mapping, plasmid isolation, restriction enzyme use, construction of chimeric (recombinant) plasmids, phage isolation and preparation.

MCB 5408: Anaerobic Microbiology and Biotechnology(3) *Prereq: MCB 3023/3023L, and BCH 4024 or CHM 4207.* Structure, physiology, metabolism, and biotechnology of anaerobes.

MCB 5458: Energy Transformation in Microorganisms (3) *Prereq: C or better in MCB 3020L; CHM 4207, BCH 3025, or 4024.* Energy transformations of dissimilatory and assimilatory processes in microorganisms with emphasis on regulation and energy cycles. Applications to microbial energy transformations to low energy technology.

MCB 5505: General Virology (3) *Prereq: MCB 3020/3020L and 4203 with grade of C or higher.* Basic information on families of viruses from humans, plants, insects, animals, and bacteria. Medical, clinical, diagnostic, biotechnological, and molecular aspects of these viruses.

MCB 6317: Molecular Biology of Gene Expression (1) Synthesis, processing, transport, and translation of RNA in microorganisms and eukaryotes. Additional topics include epigenetic regulation of gene expression.

MCB 6318: Comparitive Microbial Genomics (1) *Prereq: PCB 4522 and a working knowledge of basic bioinformatic tools.* Methods to allow experimental scientists to efficiently use genomic and post-genomic data that is publicly available. Examples taken primarily from the field of microbial metabolism and regulation.

MCB 6355: Microbial/Host Defense (1) *Prereq: MCB 4203 and PCB 5235 or equivalents, with the minimum grade of a C.* Principles of host defense to microbial invasion in a context of cellular biology involving both plants and animals.

MCB 6409: Microbial Cell Structure and Function (3) *Prereq: undergraduate biochemistry and microbiology and consent of instructor.* Review of current knowledge concerning structure, function, and biosynthesis of microbial cells.

MCB 6419: Microbial Metabolism and Energetics (1) *Prereq: MCB 4403 and BCH 4024 or CHM 3218 or equivalent.* Principles of energy and biosynthetic metabolism in aerobic and anaerobic microorganisms. Current biotechnology which incorporates these principles.

MCB 6457: Metabolic Regulation (1) *Prereq: MCB 4403 and BCH 4024 or CHM 3218 or equivalent.* Environmental sensing and mechanisms of microbial response. Molecular signaling, allosteric proteins and protein modifications. Shifts on metabolic pathways upon environmental changes. Metabolic regulation and industrial processes.

MCB 6465: Microbial Metabolic Engineering (1) *Prereq: MCB 4403 and BCH 4024 or CHM 3218 or equivalent.* Principles of anaerobic fermentation and its role in production of fuels and chemicals from various feedstocks including lignocellulosic biomass. Evaluation of methods of depolymerization of complex carbohydrate feedstocks to simple sugars for fermentation.

MCB 6485: Advanced Techniques in Microbiology and Cell Science (2-4; max: 4) *Prereq: consent of instructor.* Application of advanced techniques to experimental research in biochemistry, cell biology, and microbiology.

MCB 6772: Advanced Topics in Cell Biology (1) In each semester a specific topic in cell biology with microbiological interest will be considered in a comparative discussion of animal and plant systems.

MCB 6905: Experimental Microbiology (1-8; max: 12) *Prereq: eight credits in microbiology and cell science.* Application of physical, chemical and biological techniques to experimental problems in microbiology. Individual laboratory study. H.

MCB 6910: Supervised Research (1-5; max: 5) S/U.

MCB 6930: Seminar (1; max: 8) Attendance required of all graduate majors at all research presentations. S/U.

MCB 6937: Special Topics in Microbiology (1-4; max: 12) Contemporary research in a particular aspect of general microbiology.

MCB 6940: Supervised Teaching (1-5; max: 5) S/U.

MCB 6971: Research for Master's Thesis (1-15) S/U.

MCB 7922: Journal Colloquy (1; max: 8) Critical presentation and discussion of recent original articles in the microbiological literature. Attendance required.

MCB 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

MCB 7980: Research for Doctoral Dissertation (1-15) S/U.

PCB 5136L: Techniques in Microbial and Cell Biology (3) *Prereq: B grade or higher in MCB 3020L, CHM 3120/3120L.* A laboratory in experimental bacteriology and cell biology. Emphasis on experimental approaches and techniques used in study of cells and microorganisms. Experiments in microscopy, cell fractionation,

metabolism, physiology, genetics, and regulation.

PCB 5235: Immunology (3) *Prereq: C grade or higher in MCB 3020L.* Immune system of vertebrate animals. The cellular and molecular events involved in immune responsiveness and resistance to infectious diseases.

PCB 6176: Electron Microscopy of Biological Materials (2) *Prereq: MCB 3020 or equivalent.* Use of the electron microscope, including fixation, embedding, sectioning, freeze-etching, negative staining, and use of vacuum evaporator.

PCB 6176L: Laboratory in Electron Microscopy (2) *Coreq: PCB 6176 and consent of instructor.* Laboratory training in using electron microscopes, ultramicrotomes, vacuum evaporators, and freeze-etch machines.

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Molecular Genetics and Microbiology

College of Medicine

Graduate Faculty

Chair: H. V. Baker. *Graduate Coordinator:* A. S. Lewin. *Complete faculty listing by department*: Follow this link

The Graduate Faculty of the Department of Molecular Genetics and Microbiology participate in the interdisciplinary program (IDP) in medical sciences, leading to the Doctor of Philosophy degree, with specialization in one of the six advanced concentration areas of the IDP (see *Medical Sciences*). Departmental areas of research associated with the IDP focus on topical problems in molecular genetics, viral genetics, and viral and bacterial pathogenesis. Faculty in the Department of Molecular Genetics and Microbiology also participate in the M.S. programs (see *Medical Sciences*). In addition to courses associated with the IDP, the Department of Molecular Genetics and Microbiology maintains the courses listed below.

Biotechnology: This Master of Science program is for students seeking careers in the biomedical industry as research or managerial associates; students seeking careers as teachers or educators at any level, but primarily high school or junior college; or students seeking an in-depth understanding of modern biology and scientific research as an end in itself or in preparation for further graduate study. The foundation of the M.S. program is a basic understanding of molecular and cell biology and the performance of a high-quality research project, culminating in a thesis, under the direction of a skilled mentor, with supervision by a committee composed of members of the Graduate Faculty. Specialization may be in any of

the fields of research being pursued at the College of Medicine including but not limited to molecular genetics, gene therapy, bacterial or viral pathogenesis, protein structure, toxicology, mammalian genetics, wound healing, and congenital eye diseases.

For more information contact the Master's Program Coordinator, Molecular Genetics and Microbiology, P.O. Box 100266, College of Medicine, Gainesville, FL 32610, Telephone (352)392-3314.

GMS 6010: Yeast Genetics (1; max: 3) *Prereq: GMS 6001 or consent of instructor.* Using the yeast *Saccharomyces cerevisiae*, as a model eukaryotic cell to study the biological processes common to all eukaryotic organisms.
GMS 6011: Mouse Genetics (1; max: 3) *Prereq: GMS 6001 or consent of instructor.* Theoretical framework for understanding the fundamentals of mouse genetics and use of the mouse model to study human disease. Advanced technical tools used for research and their application to novel problems.
GMS 6012: Human Genetics (1; max: 3) *Prereq: GMS 6001 or consent of instructor.* Theoretical framework for understanding the fundamentals of human genetics. Advanced technical tools used for research.
GMS 6013: Developmental Genetics (1; max: 3) *Prereq: GMS 6001 or consent of instructor.* Theoretical framework for understanding the fundamentals of developmental genetics. Advantages and limitations of several model systems and their application to the study of development.
GMS 6014: Applications of Bioinformatics to Genetics (1) *Prereq: GMS 6001; consent of instructor.* Storage, retrieval, and analysis of information related to genetics.
GMS 6015: Human Genetics II (1) *Prereq: GMS 6012; consent of instructor.* Theoretical framework, emphasizing functional genomics and bioinformatics. Advanced technical tools used for research and development in these areas.
GMS 6034: Advanced Virology I: Genetics and RNA (1) *Prereq: consent of instructor.* Theoretical framework for understanding the fundamental concepts of viral genetics. Methods of analysis used to elucidate the mechanisms of virus reproduction.
GMS 6035: Advanced Virology II: RNA Viruses (1) *Prereq: consent of instructor.* Molecular biology and genetics of virology, focusing on the molecular biology of RNA viruses.
GMS 6036: Molecular Virology III: DNA Viruses (1) *Prereq: consent of instructor.* Molecular biology and genetics of virology, focusing on replication and pathogenesis of DNA viruses.
GMS 6038: Bacterial Genetics and Physiology (1) *Prereq: GMS 6006 or consent of instructor.* Theoretical framework for understanding fundamental concepts.
GMS 6039: Bacterial Pathogenesis (1) *Prereq: consent of instructor.* Survey of medical microbiology, focusing on the genetics and physiology of bacteria, their use as research tools, and the role of bacteria in causing disease.

GMS 6040: Host-Pathogen Interactions (1) *Prereq: consent of instructor.* Survey of medical microbiology, focusing on the host response and subsequent evasion of that response by pathogens.
GMS 6059: Gene Therapy from Bench to Bedside (1) *Prereq: GMS 6034, 6035, and 6036 or consent of instructor.* Designing and using gene transfer vectors to treat various diseases. Understanding the practical successes and hurdles of gene therapy.
GMS 6121: Infectious Diseases (3) *Prereq: consent of instructor.* Survey of medical microbiology directed at understanding infectious disease in terms of molecular pathogenesis, bacterial physiology, and genetics.
GMS 6140: Principles of Immunology (3) *Prereq: GMS 6001 or consent of instructor.* Biological and biochemical aspects of host resistance and immunity. Chemical and physiochemical properties of the proteins of immune reactions.
GMS 6145: Immunology of Gene Transfer (1) *Prereq: background in molecular biology, virology, and immunology.* Immunological aspects of gene therapy.
GMS 6151: Genetic Analysis Using Model Systems (1) *Prereq: GMS 6001 or consent of instructor.* Major model systems used in scientific research.
GMS 6153: Advanced Bacterial Genetics (2) *Prereq: GMS 6038 and consent of instructor.* Advanced principles of bacterial genetics, emphasizing work with bacteria and genetic constructs as tools in biotechnologies.
GMS 6155: DNA Microarray Data Analysis (1) *Prereq: GMS 6014 or consent of instructor.* Hands-on study of microarray data analysis and relational databases.
GMS 6169: Antimicrobial Strategies (1) *Prereq: consent of instructor.* Recent developments in the field of antimicrobial strategies including antiobiotics and their mechanisms of action, antibiotic resistance mechanisms, phage therapy, antimicrobial target identification, and vaccine approach.
GMS 6181: Special Topics in Microbiology (1-6; max: 18)
GMS 6190: Seminar (1; max:12) Presentations by invited speakers. S/U.
GMS 6195: Epigenetics Journal Club (1; max: 12) *Prereq: consent of instructor.* Presentation and critical discussions of recent original papers published in high-impact journals relating to the topic of epigenetics. S/U.
GMS 6196: Virology Journal Club (1; max: 12) Presentation and critical discussions of recent original articles in the virology literature.
GMS 6221: Ethics in Genetics(1) *Prereq: Consent of instructor* Presentation and critical discussion of relevant topics pertaining to ethics, policy and translation in genetics research.
GMS 6231: Genomics and Bioinformatics (3) *Prereq: STA 6166 and PCB 5065 or consent of instructor.* Principles of genomic characterization and bioinformatic analysis of eukaryotes.
GMS 6232: Advanced Applications of Bioinformatics in Genetics (1; max: 12) *Prereq: GMS 6014 or consent of instructor;*

programming experience. Applying bioinformatics and computational approaches to solve research problems.

GMS 6290: Genetics/Genomics Program Graduate Seminar (1) *Prereq: enrolled in campus-wide genetics and genomics program or consent of instructor.* Presentations, seminars, and critical discussions of recent original research relating to genetics and genomics.

GMS 6506: Biologic Drug Development (1) Explores the manufacturing and testing of biomedical products, quality control, quality assurance responsibilities, and regulatory compliance, providing practical understanding of the successes and hurdles that are faced in biopharmaceutical product development today.

GMS 6920: Genetics Journal Colloquy (1; max: 12) *Prereq: consent of instructor.* Critical presentations and discussions of recent original articles. S/U.

GMS 6921: Immunology/Microbiology Journal Colloquy (1; max: 12) *Prereq: GMS 6001, 6006, or consent of instructor.* Critical presentations and discussions of recent original articles.

GMS 7093: Introduction to Clinical and Translational Research (2) *Prereq: Consent of APPCI program.* Design, management, measurement, and study limitations for research in the clinical setting.

GMS 7191: Research Conference (1; max: 12) Critical discussion and appraisal of research programs of faculty and students of the department. S/U.

GMS 7192: Journal Colloquy (1; max: 12) Critical presentations and discussions of recent original articles. S/U.

GMS 7194: Biotechnology Seminar (1; max: 12) *Prereq: Prereq or coreq: Molecular Biology.* Given concurrently with BCH 7410. Presentations related to biotechnology industry by outside speakers and students.

PCB 5235L: Experiments in Immunology (1) *Prereq: MCB 3020L. Coreq: PCB 5235.* Basic seriological procedures in immunology.

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Music

College of Fine Arts

Graduate Faculty

Director: J. A. Duff. *Graduate Coordinator:* L. S. Odom.
Complete faculty listing by department: Follow this link

The School of Music offers programs leading to the Master of Music degree in music and music education. Program concentrations in music include choral conducting, composition, instrumental conducting, musicology, ethnomusicology, music theory, performance, and sacred music. In addition, the School of Music offers the Doctor of Philosophy degree in music and in music education.

The Ph.D. program in music education emphasizes college music teaching. The Ph.D. program in music includes concentrations in

--Music history and literature, with options in traditional musicology and ethnomusicology
--Composition, with options in acoustic and electroacoustic specialization

All Ph.D. students are encouraged to find opportunities to teach and lecture in their specializations; and with the assistance of their principal professors, to prepare papers, workshops, and clinics for presentation at professional conferences, in the public schools, and at colleges and universities. Students also are encouraged to publish their research in appropriate journals. Minimum requirements for the M.M. and Ph.D. degrees are given in the General Information section of this catalog. The week before classes

begin, students must take placement examinations in music history and in music theory. Students wanting to study privately in a performance studio must be auditioned and accepted by the appropriate area faculty. Voice students must demonstrate appropriate skills in language and diction. All deficiencies must be remedied.

MUC 5315: Introduction to Electroacoustic Music (3) *Prereq: MUC 2102 or equivalent.* Survey of techniques, history, literature, and materials of electroacoustic music.
MUC 6444: Composition of Electronic Music (3) *Prereq: MUC 4311 or 5315.* Experimental electroacoustic art music composition using interactive software and digital recording.
MUC 6445: Electroacoustic Music Composition: Digital I (3) *Prereq: MUC 4401 or 6444 or consent of instructor.* Introduction to direct-digital software synthesis systems through flowcharting, programming, and instrument design. Focuses on using Csound software.
MUC 6446: Electroacoustic Music Composition--Digital II (3) *Prereq: MUC 6445 or consent of instructor.* Continuation of MUC 6445. Composition and research in direct-digital software synthesis systems. Includes advanced instrument design, algorithmic composition, and interactive digital signal processing.
MUC 6900: Secondary Graduate Composition (3; max: 15) *Prereq: consent of instructor.* Individual music composition instruction for graduate students in music.
MUC 6930: Graduate Composition (3; max: 6) Composition of chamber works for instrumental and/or vocal ensembles.
MUC 6932: Composition Seminar (1-3; max: 12) Identifying problematic techniques in developing compositional craft for research, presentation, and discussion.
MUC 7447: Advanced Seminar in Electroacoustic Music (3) *Prereq: MUC 6446 or consent of instructor.* Composition and research in advanced topics in computer music.
MUC 7931: Advanced Graduate Composition (3; max: 18) Composition for large instrumental and/or vocal ensembles.
MUC 7938: Seminar in Digital Sound Processing, Control, and Composition (3) *Prereq: MUC 6646 or consent of instructor.* Topics in current research and digital audio theory, languages, algorithms, and applications for electroacoustic music.
MUE 6080: Foundations of Music Education (3) Historical development and philosophy. Compares the U.S. with other countries and cultures. Individuals, associations and institutions that shape the music education program.
MUE 6385: Music in Higher Education (3) Various aspects and programs of music in higher education for persons who intend to teach in or administer departments of music.
MUE 6444: Materials and Methods of String Class Teaching (2) Survey of materials and methods suitable for public school string classes and orchestras.
MUE 6497: Public School Orchestral Literature (2) Survey of

materials suitable for various educational levels.
MUE 6647: Trends in Teaching and Learning Music (3)
MUE 6785: Methods of Research in Music Education (3) Materials and specialized techniques of research in music education.
MUE 6931: Contemporary Curriculum Practices in Music Education (3) Explores the ways in which artistic forms of understanding and reflection can be useful in designing and evaluating education programs.
MUE 7746: Measurement and Evaluation of Music (3) *Prereq: MUS 6685.* Examines methods and techniques for measuring and evaluating learning in music.
MUE 7938: Music Education Seminar (3) Contemporary issues and problems in music education. Investigating and planning research relevant to selected problems.
MUG 6105: Graduate Conducting (3; max: 15) Conducting larger works from the standard repertoire for band, orchestra, and chorus.
MUG 7106: Advanced Graduate Conducting (3; max: 15) *Prereq: MUG 6105. For conducting emphasis.* Conducting major works for band, orchestra, and chorus. Emphasizes analysis and interpretation.
MUH 5219: Graduate Music History Review (3) *Credit earned will not apply to the credit-hour requirement of any graduate degree offered in the School of Music.*
MUH 5505: Introduction to Ethnomusicology (3) *Prereq: consent of instructor.* Field research. Using oral, written, and media sources. Transcription and analysis. Interpretative techniques.
MUH 6545: The Guitar in Latin American Culture (3) Cultural view of Latin American peoples through the sounds of the guitar, focusing on the history of modern classical guitar and its role in mediating Iberian and Latin American music.
MUH 6548: Seminar in Caribbean Music (3) Examines historical, social, and aesthetic dimensions of Caribbean music and music making.
MUH 6549: Seminar in Brazilian Music (3) Examines historical, social, and aesthetic dimensions of Brazilian music and music making.
MUH 6635: Seminar in American Music (3) History and literature of American music from the landing of the pilgrims to the present.
MUH 6660: History of Opera (3) Historical development of opera and its literature from the Florentine Camerata to the present.
MUH 6671: Seminar in Renaissance Music (3) Selected topics from the Renaissance era for research and study.
MUH 6672: Seminar in Baroque Music (3) Selected topics from the Baroque era for research and study.
MUH 6673: Seminar in Classical Music (3) Selected topics from the Classical era for research and study.
MUH 6674: Seminar in Nineteenth-Century Music (3) Selected topics from the nineteenth century for research and study.
MUH 6675: Seminar in Twentieth-Century Music (3) Selected topics from the 20th century for research and study.
MUH 6931: Nationalism in Music (3) Historical development of

nationalist movements in music. Emphasizes the 19th and 20th centuries.
MUH 7411: Medieval and Renaissance Notation(3) Practical, theoretical, and reportorial study of notation from ca. 1000-1600.
MUH 7938: Musicology Seminar (3; max: 9) *Prereq: MUS 6716.* Contemporary issues and selected topics in musicology.
MUL 6435: String Literature (3) Survey of solo study materials suitable for preparatory departments affiliated with conservatories and universities.
MUL 6486: Piano Literature (3) Survey of piano literature from Baroque to present.
MUL 6495: Graduate Organ Literature(3) An historical survey of the major trends and styles of organ composition from the Renaissance to the present.
MUL 6555: Survey of Wind Literature (3) Literature for chamber and larger wind ensembles from Baroque to present.
MUL 6565: Chamber Music Literature (3) Survey of music literature for chamber ensemble from Baroque to present.
MUL 6645: Choral Literature (3) Survey of choral music from Renaissance to present.
MUN 6010: Graduate Ensemble (1; max: 3) *For graduate students holding positions of leadership and participating in music ensembles.*
MUN 6125: Concert Band (1; max: 4) Performance of general and popular band literature.
MUN 6135: Symphonic Band (1; max: 4) Performance of traditional and contemporary band literature.
MUN 6145: Symphonic Wind Ensemble (1; max: 4) Performance of wind ensemble literature.
MUN 6215: University Orchestra (1; max: 4) Standard orchestra literature.
MUN 6315: University Choir (1; max: 4) Advanced choral group providing specialized study performance opportunities for vocally qualified students.
MUN 6325: Women's Chorale (1; max: 4) Vocal training and public performance of standard female chorus repertoire.
MUN 6335: Men's Glee Club (1; max: 4) Vocal training and public performance of standard male chorus repertoire.
MUN 6445: Percussion Ensemble (1; max: 4) Study and performance of ensemble literature for percussion instruments.
MUN 6495: Steel Drum Ensemble (1; max: 8) *Prereq: consent of instructor.* Rehearsal, performance and historical aspects of steel drum.
MUN 6496: World Music Ensemble (1; max: 4) Rehearsal and performance of folk and traditional music of the world.
MUN 6497: New Music Ensemble (1; max: 15) *Prereq: consent of instructor.* Rehearsal and performance of repertoire for small ensembles written in the 20th and 21st centuries.
MUN 6715: Jazz Band (1; max: 4) Standard and experimental jazz ensemble. Jazz laboratory.
MUR 6206: Survey of Hymnody (3) Historical development of

hymns in liturgical use, the scope of hymnic literature, and the major trends in hymnal compilation and editing.

MUR 6705: Sacred Music Literature (3) The development of congregational and choral song from the early church to the present. Survey of instrumental forms in worship music.

MUS 5911: Directed Study (1-3; max: 12) *Prereq: may not count toward completion of degree requirements.* Allows graduate students changing their degree concentration to acquire knowledge and skills not acquired in previous programs. S/U.

MUS 6547: Music and Sound Design for Digital Media (3) *Prereq: graduate-level status or consent of instructor.* Techniques, tools, and current research in music and sound design for digital media. For digital arts and science non-music majors.

MUS 6685: Foundations of Musical Behavior (3) Cultural influences, learning conditions, biological constraints, psychoacoustical phenomena, and musical taste. Measuring and predicting musical taste and ability.

MUS 6716: Methods of Musical Research and Bibliography (3) Materials and specialized techniques of research in musicology.

MUS 6905: Projects and Problems (1 to 3; max: 12 including MUS 7905) Approved problems for study and research.

MUS 6910: Supervised Research (1-5; max: 5) S/U.

MUS 6940: Supervised Teaching (1-5; max: 5) S/U.

MUS 6971: Research for Master's Thesis (1-15) S/U.

MUS 6973: Individual Project (1-10; max: 10) Creative project or graduate recital in lieu of written thesis. Project or recital must be acceptable to the candidate's supervisory committee and to the Graduate School. S/U.

MUS 7656: Teaching Music and the Creative Process (3) *Prereq: graduate composition major or consent of instructor.* Examines the creative process, appropriate pedagogical applications, and curricular implications.

MUS 7905: Projects and Problems (1 to 3; max: 12 including MUS 6905) For doctoral students. Approved problems for study and research.

MUS 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

MUS 7980: Research for Doctoral Dissertation (1-15) S/U.

MUT 6051: Graduate Music Theory Review (3) Review of core materials in preparation for graduate course in music theory.

MUT 6445: Advanced Counterpoint (3) *Prereq: MUT 4411, 4421.* Emphasizes advanced harmonic techniques and fugal writing.

MUT 6531: Figured Bass and Continuo Performance (3) Theoretical principles and practical application of figured bass realization and continuo performance practice techniques.

MUT 6565: Late Nineteenth- and Twentieth-Century Styles (3) *Prereq: MUT 6629.* Analysis of exemplary works of the late 19th and 20th centuries.

MUT 6576: Contemporary Styles (3) *Prereq: MUT 6629.* Recent trends in music through score study and analysis, composition exercises, and supplementary readings.
MUT 6624: Seminar in Set Theory (3) *Prereq: MUT 6629.* Advanced study in set theory for analysis of music.
MUT 6627: Seminar in Reductive Analysis (3) *Prereq: MUT 6629.* Advanced study in reductive approach to analysis of music.
MUT 6629: Analytical Techniques (3) Study of analytical systems and methodology emphasizing style analysis and the integration of all elements of music.
MUT 6751: Pedagogy of Music Theory (3) *Prereq: MUT 6629.* Techniques and art of teaching music theory and conditions for effective learning.
MUT 6936: Music Theory Seminar (1-3; max: 12) *Prereq: MUT 6629.* Selected topics from current research for study, presentation, and discussion.
MUT 7316: Advanced Orchestration (3) Analysis of 19th- and 20th-century compositions for full orchestra. Orchestration of original scores and arrangements for full orchestra.
MUT 7585: Seminar in Musical Style (3) *Prereq: MUT 6629.* Analysis of exemplary works from the Medieval period to the early 19th century.
MUT 7760: History of Music Theory (3) The study of musical theories, primarily through readings, from ancient Greece to the present.
MVK 5156: Improvisational Keyboard Skills and Related Technology (3) *Prereq: upper-division and graduate keyboard majors and minors, or consent of instructor.* Improvisational skills, electric keyboard technology, and musical styles outside the classical realm.
MVK 6605: Organ Pedagogy (3) Principles, methods, and practices currently used in the teaching of organ.
MVK 6651: Piano Pedagogy (3) Introduction to teaching basic piano performance and literature.
MVK 6661: Advanced Piano Pedagogy (3) Teaching materials for the intermediate and advanced student; methodologies of piano technique.
MVO 6250: Secondary Music Performance (3; max: 15) Offered in piano, voice, organ, harpsichord, historical instruments, conducting, carillon, and all standard band and orchestral instruments.
MVO 6460: Music Performance (3; max: 9) Offered in piano, voice, organ, harpsichord, historical instruments, conducting, carillon, and all standard band and orchestral instruments.
MVO 7460: Music Performance (3; max: 9) For doctoral students. Offered in piano, voice, organ, harpsichord, historical instruments, conducting, carillon, and all standard band and orchestral instruments.
MVS 6651: String Pedagogy I (3) Survey of Suzuki violin pedagogy from Unit IA (Pre-Twinkle) through Unit IV (Vivaldi A Minor Concertos).

MVV 6651: Vocal Pedagogy (3) *Prereq: SPA 3101 or equivalent.* Study and teaching of vocal techniques.

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Neuroscience

College of Medicine

Graduate Faculty

Chair: L. Notterpek. *Graduate Coordinator:* S. L. Semple-Rowland.
Complete faculty listing by department: Follow this link

Graduate Faculty in the Neuroscience Department mentor Ph.D. students enrolled in the College of Medicine Interdisciplinary Program (IDP) in the Medical Sciences. Students interested in pursuing a doctoral degree in the neurosciences can view a description of the neuroscience IDP advanced concentration at http://idp.med.ufl.edu. Research topics explored by the Neuroscience faculty include T neuroanatomy, molecular and cellular neurobiology, aging, neuroimmunology, cellular and molecular analyses of inherited neural diseases, cellular neurophysiology, somatosensory and motor systems, transplantation neurobiology, injury and repair of the central nervous system, and neurobehavioral sciences. Interdisciplinary study in marine vertebrate and invertebrate neurobiology is available at the Whitney Laboratory. Departmental faculty at the Whitney Laboratory are conducting research directed toward understanding basic neurobiological mechanisms using simple marine vertebrate and invertebrate model systems. The Department of Neuroscience offers the courses listed below which are cross listed under the IDP Advanced Concentration in Neuroscience section under Medical Sciences. These courses are open to all graduate students and advanced undergraduate students with permission of the instructors.

GMS 6021: Principles of Neuroscience I: Organization and

Development of the Nervous System (2) *Prereq: GMS 6001 or consent of instructor.* Principles governing neural development and plasticity of the vertebrate central nervous system.

GMS 6022: Principles of Neuroscience II: Cellular and Molecular Neuroscience (2) *Prereq: GMS 6001 or consent of instructor.* Principles governing intercellular communication within the nervous system.

GMS 6023: Principles of Neuroscience III: Neural Integration and Control (2) *Prereq: GMS 6001 or consent of instructor.* Principles governing the integration and control of information processing within the central nervous system.

GMS 6029: Brain Journal Club (1; max: 12) *Prereq: consent of instructor.* Opportunities to present and participate in discussions of top-tier research papers in the neurosciences. S/U.

GMS 6051: Signal Transduction (1) *Prereq: GMS 6001 or consent of instructor.* Focuses on the mechanisms underlying cellular signal transduction.

GMS 6074: Comparative and Evolutionary Neurobiology (3) *Prereq: GMS 6007 or consent of instructor.* Broad perspective of nervous system evolution, structure, and function in different species. Comparisons of cytoarchitectural principles that produce mammalian nervous systems are additional focus.

GMS 6078: Synaptic Function and Plasticity (1) *Prereq: consent of instructor.* Synapses that mediate fast electrical excitation and inhibition in the mammalian brain and how these synapses change with development and experience. Molecular biology of glutamate, GABA, and nicotinic acetylcholine receptor subtypes, experimental paradigms for studying long-lasting changes in synaptic function, and changes in animal behavior related to neuroplastic events.

GMS 6079: Computers in Biology (1) *Prereq: GMS 6001 or consent of instructor.* Students will be introduced to the use of computers in studies of protein and nucleic acid sequences and cellular function.

GMS 6080: Basic Magnetic Resonance Imaging (1) *Prereq: GMS 6007 or consent of instructor.* Principles behind nuclear magnetic resonance imaging (MRI) and spectroscopy (MRS) and how these methods are applied to studies of the human brain.

GMS 6705: Functional Human Neuroanatomy (4) *Prereq: consent of instructor.* Intensive introduction to the anatomy, function, and dysfunction of the human central nervous system.

GMS 6709: Current Topics in Vision (1) *Prereq: GMS 6001 or consent of instructor.* Genetics, molecular biology, and biochemistry underlying vision and the diseases that affect this important human sense.

GMS 6711: Neurobiology of Pain (1) *Prereq: GMS 6001 or consent of instructor.* Overview of neurobiological processes involved in pain, including methods of investigating pain processing in humans and other animals.

GMS 6719: Fundamentals of Computational Neuroscience (2) *Prereq: basic knowledge of calculus and computing and/or consent of instructor.* Major concepts of neural signaling and communication

from a single neuron to systems of neural ensembles, and the role of neural computation.

GMS 6750: Molecular Pathobiology of Neural Disease (1) *Prereq: consent of instructor.* Overview of a broad range of neural disorders emphasizing genetically determined conditions.

GMS 6760: Comparative Biology of Cell Signaling (2) *Prereq: GMS 6001 or consent of coordinator.* Overview of the principles governing cellular and molecular signaling in the nervous system. Introduction to novel experimental approaches and non-mammalian preparations used to explore these principles.

GMS 6791: Visual Neuroscience Journal Club (1; max: 2) *Prereq: 1st-year IDP core course; or consent of instructor.* Presentation and discussion of cutting-edge research papers. S/U.

GMS 6xxxY: Biological Imaging Techniques (1) *Prereq: GMS 6001 or consent of instructor.* Basic principles and advanced applications of biological imaging, with a focus on optical methods and visualization techniques.

GMS 7794: Neuroscience Seminar (1; max: 12) Research seminars given by local, national, and occasionally international speakers. S/U.

GMS 7795: Special Topics in Neuroscience (1-4; max: 12) Specialized subjects in the neurosciences and allied disciplines. Current topics include biological imaging techniques, fundamentals of computational neuroscience, graduate research seminar series, write clubs, scientific communication workshop (Whitney Lab), and electrophysiological journal club (Whitney Lab).

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Nuclear and Radiological Engineering

College of Engineering

Graduate Faculty

Chair: D. Hintenlang. *Graduate Coordinator:* W. Bolch. *Complete faculty listing by department*: Follow this link

The Department offers the degrees of Master of Science, Master of Engineering, and Doctor of Philosophy in nuclear engineering sciences with emphases in nuclear power engineering, medical physics, and health physics. Complete descriptions of the minimum requirements for these degrees are provided in the *General Information* section of this catalog.

The medical physics and health physics options are offered through interdepartmental programs in cooperation with the College of Medicine (see the *Health Physics and Medical Physics* description under *Interdisciplinary Graduate Studies*).

Combined Program––The Department also offers a B.S.N.E./M.S. degree program. This program allows qualified students to earn both a bachelor's degree and a master's degree with a savings of one semester. Qualified students may begin their master's program while seniors counting 12 hours of specified nuclear engineering sciences graduate courses for both the bachelor's and master's degree requirements. Seniors admitted to the combined program are eligible for teaching and research assistantships. Program admission requirements are (1) satisfaction of Graduate School admission requirements for a master's degree, (2) an upper-division (undergraduate) GPA of at least 3.6, and (3) completion of specified bachelor's degree requirements.

The graduate program has two major programs, Nuclear Engineering and Medical Physics. Specific areas of research and study in Nuclear Engineering include advanced nuclear power concepts and systems,digital control of nuclear reactor power plant technology and operations, reactor dynamics and control, and advanced radiation detectors and analysis in support of nuclear forensics and homeland security.The Medical Physics program is a CAMPEP accredited program designed to meet the professional requirements for a career in clinical service or research and development. Areas of Medical Physics study and research include diagnostic medical imaging, radiation therapy, nuclear medicine imaging, and radiation dosimetry.

The requirement for admission to the graduate program in nuclear engineering sciences is a bachelor's degree in an approved program in engineering or in the sciences. Students applying to the Medical Physics program should have completed the equivalent of at least a minor in physics. If the student's background is considered deficient for the planned course of study, an articulation program of background courses will be required.

Depending on professional objectives, the student may select a non-thesis option for the MS degree and substitute 8 credits of graduate-level course work, of which at least 6 credits are in nuclear engineering sciences, including a 4-credit (minimum) special project (ENU 6936). Completion of 32 credits will meet the minimum requirements for the non-thesis MS degree.

Normally, the requirements for a master's degree can be completed in 12 months. Students in the medical physics option usually take 21 to 24 months to complete the master's degree, which requires 40-42 credit hours. For a master’s degree in health physics, a student must complete 42 hours of credit. If articulation work is required, it may take longer, depending upon the extent of the student's deficiency.

ENU 5142: Reliability and Risk Analysis for Nuclear Facilities (3) *Prereq: ENU 4144 or 5005 and 4934 or 6935.* Nuclear facilities' safety systems including reliability and probabilistic risk assessment.
ENU 5176L: Principles of Nuclear Reactor Operations Laboratory (1) *Prereq: ENU 4144 or equivalent and consent of instructor.* Principles of reactor operations applied to startup, operation, and control of the training reactor to include performing reactor physics measurements and instrumentation and control calibrations.
ENU 5186: Nuclear Fuel Cycles (3) *Prereq: ENU 4104.* Fuel cycle from uranium mining through waste management. Reactor fuel cycle including economics and advanced fuel management. Nodal code evaluation of criticality, power peaking and power sharing through operating cycle, use of burnable poisons and reshuffle and

reload for uranium and plutonium cycles.

ENU 5196: Nuclear Reactor Power Plant System Dynamics and Control (3) *Prereq: ENU 4192 and EEL 4657 or EML 5311.* Control theory analysis applied to nuclear power reactor dynamic models with feedback and to integrated nuclear power plant dynamic models with feedback.

ENU 5516L: Nuclear Engineering Laboratory II (2) *Prereq: ENU 4612L or 5615L and 4104 or 6106.* Laboratory practice in neutron and gamma detection and analysis. Determination of basic neutron parameters in nonmultiplying and multiplying media.

ENU 5615: Nuclear Radiation Detection and Instrumentation (4) *Prereq: ENU 3003 and EEL 3303L or equivalent. Coreq: ENU 6051; or prereq of ENU 4605 or equivalent.* Interaction of radiation with matter, radiation-detection systems, pulse shaping, amplification, amplitude and time-analyzing circuitry; counting and measuring devices and control systems for nuclear reactors.

ENU 5615L: Nuclear Radiation Detection and Instrumentation Lab (1) Laboratory associated with ENU 5615.

ENU 5626: Radiation Biology (3) *Prereq: one year each of college biology, chemistry, and physics; permission of instructor.* Effects of radiation on biological molecules, cells, and man including cancer and mutagenesis; use of radiation in treatment of disease.

ENU 5658: Image Analysis with Medical Physics Applications (3) Description and processing of images obtained using X-ray/neutron fields. Filtering, enhancement, reconstruction of CT and coded aperture images. Digital and optical methods.

ENU 5705: Advanced Concepts for Nuclear Energy (3) *Prereq: ENU 4104, 4144 and EML 3100.* Plasmas and thermonuclear fusion; fast reactors, advanced LWRs, and other advanced fission reactors; nuclear pumped lasers; TE, TI, and MHD conversion and Stirling engines as applied to advanced reactor concepts.

ENU 6051: Radiation Interaction Basics and Applications I (3) Interaction of X-rays, gamma rays, neutrons, and charged particles with matter; radioactive decay, nuclear moments, and nuclear transitions. Application to basic problems in nuclear engineering sciences.

ENU 6052: Radiation Transport Basics and Applications (3) Particle distribution functions. Elementary transport and statistical description of particulate matter. Development of transport relations and their solutions. Applications to basic problems in nuclear engineering sciences.

ENU 6053: Radiation Interaction Basics and Applications II (3) Continuation of ENU 6051. Nuclear Structure, stability and models; nuclear reactions; ionization of matter by charged particles, neutrons, and electromagnetic radiation with application to basic problems in nuclear engineering sciences.

ENU 6061: Survey of Medical Radiological Physics (1) *Prereq: undergraduate classical and modern physics, and differential equations.* An overview of the areas of medical radiological physics including diagnostic radiography, nuclear medicine, and radiation therapy. Basic radiation physics, biology, and safety.

ENU 6106: Nuclear Reactor Analysis I (3) *Prereq: ENU 6051.* Nuclear criticality, neutron transport equation, multigroup neutron diffusion theory, and perturbation theory. Reactor kinetics: point model, reactivity feedback, and space-time models.

ENU 6107: Nuclear Reactor Analysis II (3) *Prereq: ENU 6106.* Fast and thermal spectrum calculations for homogeneous and heterogeneous reactor cores. Nuclear reactor core design including nuclear and thermal hydraulic analyses. Core power distributions, composition changes, and reactivity control.

ENU 6126: Fundamentals of Reactor Kinetics (3) *Prereq: ENU 4001, ENU 4605, ENU 4103.* Nuclear reactor kinetics, including mathematics, transport and diffusion considerations, steady state and time dependent reactor physics, delayed neutron properties, photoneutrons, and neutron reactions, approximations and solutions to the kinetics equations, numerical solution methods using explicit, implicit, integral, marching, and finite difference solution methods.

ENU 6623: Radiation Dosimetry (3) Concepts, dosimetry quantities and units, calculations for external gamma, beta, and neutron radiation, calculation of dose from internal radioactivity, dose measurements concepts, gamma and beta dose measurements, dose assessment from survey and personnel monitoring.

ENU 6627: Therapeutic Radiological Physics (3) *Prereq: ENU 5615, ENU 6051.* Introduction to radiation therapy physics: teletherapy, brachytherapy, interstitial therapy. Production of photons and electrons for therapeutic use. Radiation measurement and dosimetry clinical applications. Radiation protection and quality assurance.

ENU 6636: Advanced Radiation Shielding Design (3) *Prereq: ENU 6051, 6053.* Shielding design fundamentals. Methods of calculating gamma-ray attenuation, fast neutron penetration, effects of ducts and voids in shields, problems of heat generation and deposition in reactor components.

ENU 6651: Clinical Rotation in Radiation Therapy (3) *Prereq: working knowledge of therapeutic radiological physics.* Experience in clinical therapeutic radiological procedures, patient dosimetry, and treatment planning.

ENU 6652: Clinical Rotation in Diagnostic Radiology (3) *Prereq: working knowledge of diagnostic radiological physics.* Experience in clinical diagnostic radiological procedures. Application of physical principles to imaging and the quality assurance of the imaging chain.

ENU 6655: Advanced Diagnostic Radiological Physics (3) Applying advanced physical principles, image acquisition, and processing techniques to clinical imaging physics. Methods and principles of MRI and ultrasound imaging. Digital image archiving, transmission and processing standards, and networks.

ENU 6657: Diagnostic Radiological Physics (3) *Prereq: ENU 5615, 6051, 6053.* X- and gamma-ray production and spectra. Radiopharmaceuticals. Medical imaging concepts and hardware. Clinical overview of diagnostic x-ray and nuclear medicine.

Application of radiation protection principles.

ENU 6659: Nuclear Medicine Instrumentation and Procedure (3) *Prereq: ENU 5615 or equivalent.* Theory, evaluation, applications of detecting and imaging systems in nuclear medicine including collimators, scintillation probes, cameras, data-processing devices; uses of radionuclides in medicine for radiopharmaceutical preparation.

ENU 6905: Individual Work (1-6; max: 12) Supervised study or research in areas not covered by other graduate courses.

ENU 6910: Supervised Research (1-5; max: 5) S/U.

ENU 6935: Nuclear and Radiological Engineering Seminar (1; max: 3) Discussion of research, current trends in the nuclear related industry, government, and research establishments.

ENU 6936: Special Projects in Nuclear and Radiological Engineering Sciences (1-9; max: 12) Nonthesis research projects. H.

ENU 6937: Special Topics in Nuclear and Radiological Engineering Sciences (1-9; max: 12) H.

ENU 6971: Research for Master's Thesis (1-15) S/U.

ENU 6972: Research for Engineer's Thesis (1-15) S/U.

ENU 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

ENU 7980: Research for Doctoral Dissertation (1-15) S/U.

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Nursing

College of Nursing

Graduate Faculty

Chairs: M. Hinze, S. Schaffer, and M.J. Snider.
Graduate Coordinator: K. Miles. *Complete faculty listing by department*: Follow this link

The nationally ranked College of Nursing offers the graduate degrees of Master of Science in Nursing, Doctor of Nursing Practice, and Doctor of Philosophy in nursing sciences. Requirements for these degrees are given in the General Information section of this catalog. Students may request special review by the College of Nursing Admissions Committee if they believe they are strong candidates for graduate study but do not fully meet all criteria.

For additional information about the Nursing programs, visit http://www.nursing.ufl.edu or call (352)273-6331.

Master of Science in Nursing: The master's degree prepares nurses for advanced practice, clinical nurse specialist, or to be a clinical nurse leader. The graduate nursing core includes nursing theory, research, statistics, health policy, ethics, finance, and health promotion. The advanced practice core includes specific theory and clinical courses with relevant clinical experiences.

The College offers the master's degree and post-master's certification for nurse midwifery and the following nurse practitioner roles: acute care, adult, family, pediatric, and neonatal.

Additional offerings include:
--Psychiatric/mental clinical nurse specialists/nurse practitioners
--Clinical nurse leader

Graduates are eligible for Florida licensure and national certification. To be considered for the M.S.N. program, students must meet the following minimum requirements:

--Bachelor of Science in Nursing degree with an upper-division grade point average of 3.0 or higher from a nationally accredited program

--A minimum score of 500 on each of the verbal and quantitative sections of the Graduate Record Examination (GRE)

--Completion of the GRE analytical section

--Eligibility for licensure to practice as a registered nurse in the state of Florida

Application materials can be found on the following website http://www.nursing.ufl.edu/prospective/prospective_msn_application_process.shtml.

Doctor of Nursing Practice: The College of Nursing offers a program leading to the degree of Doctor of Nursing Practice (D.N.P.). The program prepares advanced practice nurses with the knowledge, skills, and abilities needed in today's complex health care environment and produces advanced practice nurses with educational background comparable to health care practitioners in other fields.

Admission: To be considered for the D.N.P. program, students must meet the following minimum requirements:

-- A bachelor of science in nursing degree for the BSN/DNP program or a master's degree in nursing for the post master's DNP program

-- A GPA of at least 3.0 on a 4.0 scale.

-- A score of 500 or higher on each of the verbal and quantitative sections of the Graduate Record Examination (GRE).

-- Completion of the GRE analytical section.

-- Current licensure (or eligibility) in the state of Florida

Program of study: The D.N.P. program consists of 93 credits that can be completed in 8 semesters of full-time study or 14 semesters of part-time study. Students who already have an M.S.N. degree are able to satisfy the requirements of the D.N.P. curriculum upon completion of 48 credits.

Ph.D. in Nursing Sciences: The College's PhD program prepares scientists, scholars, advanced practitioners, and leaders in nursing. Comprehensive research and practice preparation is achieved by pairing students with faculty. Students have access to an array of faculty members for interdisciplinary study, clinical practice, and research. Individually directed dissertation research is a major aspect of the Ph.D. program. Research in the College includes aging and health, women's health, bio-behavioral interventions, and health policy.

Progression in the program depends on the student's ability to meet academic standards and clinical competencies as defined by College policy. To be considered for admission to the Ph.D. program, students must meet the following minimum requirements:

--A master's degree in nursing or other health-related field and a GPA of at least 3.0 on a 4.0 scale

--A minimum score of 500 on each of the verbal and quantitative sections of the Graduate Record Examination (GRE)

--Completion of the GRE analytical section

--Eligibility for licensure to practice as a registered nurse in the state of Florida

A personal interview is preferred to establish a Graduate Faculty mentor who will work with the student to individualize the academic program and to structure the student's research or practice focus.

NGR 5934: Cultural Influences on Health Care (2)
NGR 6002C: Advanced Health Assessment (4) *Prereq or coreq: NGR 6140. Required core course.* Diverse clients across the life span. Emphasizes data analysis and diagnostic reasoning.
NGR 6005: Principles of Clinical Outcomes Management II (2) *Prereq: NGR 6081, 6727, 6803. Coreq: NGR 6726, 6771.* Health care management using the principles of evidence-based practice.
NGR 6020C: Advanced Neonatal Health Assessment and Diagnostic Reasoning (4) *Prereq: NGR 6320C, 6140.* Symptom/health problem assessment in the neonate. Interpretation of screening and diagnostic tests to formulate a differential diagnosis.
NGR 6052C: Adult Nursing: Diagnostics and Procedures (1) *Prereq: NGR 6002C, 6101, 6140, 6636. Prereq or coreq: NGR 6241, 6241L or 6245L, 6192, 6803.* Selected advanced practice nursing interventions used in caring for acutely ill adults.
NGR 6053C: Acute Care Nurse Practitioner: Diagnostics and Procedures for the Critically Ill (1) *Prereq: NGR 6002C, 6101, 6140, 6636. Prereq or coreq: NGR 6052C, 6241, 6241L or 6245L, 6192, 6803.* Necessary nursing skills in caring for the critically ill in acute-care settings.
NGR 6081: Principles of Clinical Outcomes Management I (3) *Prereq: NGR 6002C, 6101, 6130, 6636, 67770. Coreq: NGR 6193, 6727.* Health care management of client aggregates.
NGR 6101: Theory and Research for Nursing (3) Critical examination of theory and research from nursing and related fields. Emphasis on relationships among theory, research, and practice.
NGR 6130: Ethical Perspectives in Nursing (2) *Prereq: NGR 6101. Required core course.* Analysis of theories of value acquisition, models of ethical decision making, and critical ethical incidents in nursing practice and research.
NGR 6140: Physiology and Pathophysiology for Advanced Nursing Practice (4) *Required core course.* Human physiology, including normal changes throughout the life span, pathophysiology, and their implications for nursing.

NGR 6150: End of Life Care(3) Issues faced by individuals with terminal diagnoses across the lifespan.
NGR 6175: Pharmacotherapeutics for Advanced Practice Neonatal Nursing (3) *Prereq: NGR 6320C, 6020C, 6140.* Selection and management of drug therapy and monitoring therapeutic responses in the neonate.
NGR 6190: Health Care Policy and Organizational Delivery (2) *Required core course.* Overview of health care policy. Framework for understanding and evaluating organizational implications of health care delivery.
NGR 6192: Pharmacotherapeutics for Advanced Practice Nursing (4) *Prereq: NGR 6002C, 6140. Required core course.* Selection and management of clinical drug applications in advanced nursing practice in primary care settings.
NGR 6193: Policy, Organization, and Finance of Health Care Systems(4) *Prereq: NGR 6101.* Social policy and principles of economic and behavioral management in health care delivery.
NGR 6240: Primary Care for Adults (3) *Prereq: NGR 6140, 6002C. Required core course.* Primary care and nursing management of adults experiencing common alterations in their health.
NGR 6241: Adult Nursing: Common Health Problems (4) *Prereq: NGR 6002C, 6636, 6101, 6140. Prereq or coreq: NGR 6052C, 6192, 6241L or 6245L, 6803.* Advanced nursing management of common health problems. Caring for adults with single and multisystem diseases in acute and outpatient settings.
NGR 6241L: Adult Nurse Practitioner: Common Health Problems Laboratory (2) *Prereq: NGR 6002C, 6636, 6101, 6140. Prereq or coreq: NGR 6052C, 6192, 6241, 6803.* Advanced nursing management of common health problems in adults with single and multisystem diseases in acute and outpatient settings. Clinical application by nurse practitioners.
NGR 6243: Acute Care Nurse Practitioner: Critically Ill Adult (4) *Prereq: NGR 6052C, 6053C, 6241, 6241L. Coreq: NGR 6243L.* Caring for physiologically unstable adults with multiple complex health problems requiring critical care and emergency stabilization.
NGR 6243L: Acute Care Nurse Practitioner: Critically Ill Adult Laboratory (2) *Prereq: NGR 6052C, 6053C, 6241, 6241L. Coreq: NGR 6243.* Advanced management of critically ill adults. Clinical application. Focuses on caring for physiologically unstable adults. S/U.
NGR 6244: Adult Nursing: Chronic Health Problems (2) *Prereq: NGR 6052, 6241, 6241L. Coreq: NGR 6244L or 6246L, 6255.* Advanced nursing management of chronic health problems. Focuses on caring for adults with multisystem health problems requiring ongoing management in acute and out-patient settings.
NGR 6244L: Adult Nurse Practitioner: Chronic Health Problems Laboratory (2) *Prereq: NGR 6052C, 6241, 6241L. Coreq: NGR 6244, 6255.* Advanced nursing management of health problems in adults. Clinical application. Focuses on providing adult care in acute and outpatient settings. S/U.
NGR 6245L: Adult Clinical Nurse Specialist: Common Health Problems Laboratory (2) *Prereq: NGR 6002C, 6101, 6140, 6636. Prereq or coreq: NGR 6052C, 6192, 6241, 6803.* Advanced nursing management of common health problems in adults. Clinical application, by clinical nurse specialists.
NGR 6246L: Adult Clinical Nurse Specialist: Chronic Health Problems Laboratory (2) *Prereq: NGR 6052, 6241, 6245L. Coreq: NGR 6244, 6255.* Clinical application of advanced nursing management by clinical nurse specialists in the chronic health problems of adults.
NGR 6255: Advanced Nursing Care of Older Adult (2) *Prereq: NGR 6241,*

6241L, 6192. Coreq: NGR 6244, 6244L. Health care problems that result from normal and pathologic aging. Emphasize on gaining the knowledge needed to prevent, diagnose, and manage both acute and chronic age-related health problems.

NGR 6320C: Neonatal Care I (2) *Prereq or coreq: NGR 6101, 6020C, 6140, 6630.* Advanced theory and care of low-risk neonates.

NGR 6321C: Neonatal Care II (5) *Prereq: NGR 6320C. Prereq or coreq: NGR 6175, 6803.* Advanced theory and care of high-risk and critically ill neonates.

NGR 6323C: Neonatal Care III (5) *Prereq: NGR 6321C.* Advanced theory and care of high-risk infants with complex and chronic health problems.

NGR 6331C: Pediatric Primary Care I (6) *Prereq: NGR 6002C, 6140, 6636. Coreq: NGR 6192.* Advanced study in nursing for maintaining health and preventing diseases in children.

NGR 6332C: Pediatric Primary Care II (6) *Prereq: NGR 6331C.* Nurse practitioner management of common pediatric health problems.

NGR 6450C: Nurse-Midwifery Care I (7) *Prereq: NGR 6002C, 6140, 6192, 6240.* Management of women seeking gynecological, antepartal, intrapartal, or postpartal care and care of newborns.

NGR 6451C: Nurse-Midwifery Care II (6) *Prereq: NGR 6450C.* Management of at-risk women seeking gynecological, antepartal, intrapartal, or postpartal care and at-risk infants.

NGR 6500C: Individual and Family Therapy for Psychiatric-Mental Health Nursing (6) *Prereq or coreq: NGR 6002C, 6101, 6140, 6192, 6538, 6636.* Assessment, prevention and/or treatment and rehabilitation of clients with major psychiatric disorders and their families.

NGR 6501C: Group Therapy and Community Interventions for Psychiatric-Mental Health Nursing (6) *Prereq: NGR 6500C.* Current theories in group therapies for adult clients with dysfunctional interpersonal patterns and communities with dysfunctional patterns.

NGR 6538: Psychopharmacology for Psychiatric Nursing (3) *Prereq or coreq: NGR 6192.* Knowledge base for prescribing and managing psychotropic medications in treating psychiatric disorders.

NGR 6601C: Family Nurse Practitioner I (6) *Prereq: NGR 6140, 6002C, 6636. Prereq or coreq: NGR 6192, 6240.* Theories and practice in health care of reproductive families and children from infancy through adolescence.

NGR 6602C: Family Nurse Practitioner II (6) *Prereq: NGR 6601C.* Theories and practice in the health care of individuals in early, middle, and late adulthood.

NGR 6621: Public Health Nursing Competencies (3) *Prereq or coreq: NGR 6636.* Foundations of public health and public health nursing.

NGR 6622L: Public Health Nursing Clinical Practice I (2) *Prereq or coreq: NGR 6636; PHC 6001, 6112, 6313, 6621.* Clinical application of concepts in advanced public health nursing. Emphasizes assessment and surveillance. S/U.

NGR 6623L: Public Health Nursing Clinical Practice II (3) *Prereq: NGR 6621, 6622L; PHC 6001, 6112.* Clinical application of the concepts of advanced public health nursing. Emphasizes selecting appropriate interventions. S/U.

NGR 6636: Wellness Promotion and Disease Prevention (3) *Required core course.* Theory and research to promote and preserve wellness lifestyles in client populations using epidemiological principles, disease risk appraisal and reduction, and other tools.

NGR 6726: Management of the Care Environment II (3) *Prereq: NGR 6081, 6727. Coreq: NGR 6005, 6771, 6803.* Functions of the health care team in

maintaining high-quality care.

NGR 6727: Management of the Care Environment I (2) *Prereq: NGR 6130, 6002C, 6770. Coreq: NGR 6081, 6193.* Functions of health care systems and organizational structure.

NGR 6740: Role Transition: Issues in Advanced Practice Nursing(2) *Prereq: 1 clinical course, NGR 6193.* Analysis of current practice issues and roles of nurses in advanced practice.

NGR 6751: Seminar: The Nurse Midwife (2) *Prereq or coreq: NGR 6451C. Required for nurse-midwifery students.* Analyzing and synthesizing role behaviors of the nurse-midwife as a clinical specialist in selected settings.

NGR 6770: Leadership/Role of Clinical Nurse Leader (2) *Prereq: admission to the CNL track of the M.S.Nsg. program. Coreq: NGR 6130, 6193.* Introduction to the role of a clinical nurse leader.

NGR 6771: Clinical Nurse Leader Role Seminar(2) *Prereq: NGR 6081, 6727; coreq: NGR 6005, 6726.* Synthesis of concepts presented within clinical nurse leader curriculum.

NGR 6803: Research Methods and Utilization for Nursing (3) *Prereq: NGR 6101.* Knowledge and skills to critique theory and research from nursing and related fields as a basis for evidence-based practice.

NGR 6815: Foundations of Qualitative Research in Nursing (3) *Prereq: NGR 6101 or equivalent, and NGR 6803 or equivalent.* Introduction to philosophical, historical, and theoretical bases.

NGR 6840: Applied Statistical Analysis I (3) *Prereq: NGR 6803 or equivalent and doctoral statistics orientation.* Advanced procedures for data analysis and statistical inference in nursing research.

NGR 6845: Applied Statistical Analysis II (3) *Prereq: NGR 6840.* Analysis and application of advanced multivariate statistical procedures to develop design for individual research questions.

NGR 6905: Individual Study (1-3; max: 6)

NGR 6930: Special Topics in Nursing (1-3; max: 6)

NGR 6941: Practicum in Nursing (3 or 6; max: 6) *Prereq: satisfactory completion of core and clinical courses. Required for all students.* S/U.

NGR 6942: Clinical Nurse Leader Residency/Internship (1-3; max: 3) *Prereq: all required courses in the CNL track.* Full-time residency experience provides an opportunity for immersion in the CNL role. S/U.

NGR 6944: Individual Clinical Practice (1-4; max: 6) *Prereq: enrollment in or completion of graduate-level courses in clinical nursing.* Additional opportunities for advanced nursing practice. Objectives to be developed collaboratively by the student and faculty. S/U.

NGR 6970: Research for Master's Project (1-4) S/U.

NGR 6971: Research for Master's Thesis (1-15) S/U.

NGR 7003: Advanced Diagnostic Reasoning (3) *Prereq: NGR 7890.* Students engage in inductive or inferential processes to derive diagnoses using data sets and information technology.

NGR 7115: Philosophy of Nursing Science (3) Critical examination of the meaning, method, and logical structures of science and nursing sciences. Emphasizes the logical methodological analyses of aims, methods, criteria, concepts, laws, and theories.

NGR 7124: Theory Development in Nursing (3) *Prereq: NGR 7115.* Analysis of existing paradigms, theories, and theoretical models, derived or tested through research in nursing.

NGR 7133: Ethical Theories and Rational Decision Making in Health (3) *Prereq: admission to doctoral program or consent of instructor.* Analyzing ethical theories and testing the applicability of theory in nursing.
NGR 7176: Advanced Topics in Pharmacotherapeutics in Nursing (3) *Prereq: NGR 6140, 6192.* Complex care issues related to pharmacotherapeutics as an integral part of overall treatment.
NGR 7624: Interventions for Public Health Nursing (3) *Prereq or coreq: NGR 6621.* Empirical literature as a guide for selecting public health interventions and to support evidence-based public health nursing practice.
NGR 7700: Leadership and Role Development in Advanced Nursing Practice (; max: 3) *Prereq: NGR 6636.* Knowledge and skills needed to manage change, empower others, and influence political processes.
NGR 7814: Field Methods for Health Related Research (3) *Prereq: NGR 6815.* Data collection methodologies used in qualitative nursing research.
NGR 7816: Quantitative Research Design and Measurement in Nursing (3) *Prereq: NGR 6101 or equivalent and NGR 6803 or equivalent.* Evaluation of quantitative research methods and designs with attention to internal and external validity.
NGR 7831: Quality Indicators in Nursing Systems (3) *Prereq: PHC 6001, NGR 6101.* Evaluation activities that support creation and management of knowledge in nursing systems.
NGR 7871: Nursing Informatics and Data (3) *Prereq: NGR6101.* Technological applications for nursing.
NGR 7890: Outcomes Research and Evaluation (3) *Prereq: NGR 7871, PHC 6050.* Measurement and evaluation of the end results of clinical nursing care practices and interventions.
NGR 7891: Health Policy and Finance in Advanced Nursing Practice (3) Health policy development, analysis, and implementation.
NGR 7940L: Residency in Advanced Nursing Practice (3 or 6) *Prereq: NGR 7003. Pre- or Coreq: NGR 7970.* Concentrated clinical experience for the role of advanced nursing practitioner.
NGR 7970: Advanced Nursing Project (1 to 3) *Pre- or coreq: NGR 7003.* Terminal project. Student demonstrates synthesis of learning and expertise in clinical practice commensurate with a Doctor of Nursing Practice degree.
NGR 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
NGR 7980: Research for Doctoral Dissertation (1-15) S/U.

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Nutritional Sciences

College of Agricultural and Life Sciences

The field of nutritional science has unprecedented public interest. This is fostered by evolving links between diet and health, and the impact of one's individual genetic makeup on nutrient utilization. The PhD degree program in Nutritional Sciences is interdisciplinary, with participating CALS, COM, CLAS, and CVM faculty directing research of doctoral students, where the full spectrum of Nutritional Sciences is available. Emphasis areas include basic nutritional sciences, biochemistry and molecular biology, genetics, immunology, physiology, and biostatistics.

Students are admitted to the program after the Bachelor's degree or a Master's degree in nutritional sciences or a related field. Applicants should have a strong undergraduate background in biological sciences and chemistry. Experience in nutritional science is recommended. Deficiencies may be made up during the first year of graduate study.

Additional information can be found at http://nutritionalsciences.centers.ufl.edu.

For additional information, please contact Dr. Robert J. Cousins, Director at cousins@ufl.edu or Dr. Mitchell D. Knutson, Graduate Coordinator at mknutson@ufl.edu.

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Occupational Therapy

College of Public Health and Health Professions

Graduate Faculty

Chair: W. C. Mann. *Graduate Coordinator:* C. A. Velozo, J.J. Foss.
Complete faculty listing by department: Follow this link

The Department of Occupational Therapy offers graduate programs in occupational therapy leading to the Master of Health Science (M.H.S.) degree (on-campus nonthesis and thesis options and distance learning nonthesis option) and the entry-level Master of Occupational Therapy (M.O.T.) degree. Complete descriptions of the requirements for these degrees are provided in the General Information section of this catalog.

Master of Health Science: This program is designed for students who have earned an undergraduate degree in Occupational therapy. The thesis option requires four semesters of course work and a formal research thesis, while the nonthesis option requires three semesters of course work and a research project. The program emphasizes research and advanced theories related to occupational therapy practice. Preparation for teaching, administrative, and other occupational therapy roles is supplemented through elective courses. A coherent series of elective courses related to occupational therapy must be approved by the supervisory committee chairperson before the second semester of work.

In addition to the requirements of the Graduate School, admission requires the candidate to have completed a curriculum in occupational therapy accredited by the American Occupational

Therapy Association or by the World Federation of Occupational Therapists.

The distance learning degree option for the Master of Health Science is specifically intended to meet the needs of the working professional. The nonthesis program is designed to improve the knowledge and skills of working occupational therapists for practice in a complex and challenging health care system. It provides preparation for new practice areas, leadership roles, and independent practice and is delivered through the Internet. In addition to the departmental requirements listed above, applicants to the distance learning program must have basic personal computer competency and access to a computer that meets minimal configuration requirements.

Additional information about the Master of Health Science is available at http:// ww.hp.ufl.edu or http://gradschool.rgp.ufl.edu or by telephone at (352)273-6817. For distance learning, see http://otdlm.phhp.ufl.edu/ or call toll free (866)878-3297.

Master of Occupational Therapy: This entry-level degree program is designed for students who do not have an undergraduate degree in occupational therapy. The program provides students with a holistic perspective, including an understanding of the philosophical and theoretical bases for practice in the current health care environment. The M.O.T. program provides a strong background in theory, assessment, and therapeutic interventions. Before their professional preparation in the M.O.T. program, students receive a liberal education in their pre-professional baccalaureate studies, including several courses specifically focused for students planning to enter the M.O.T. program. Students may enroll in courses in the Bachelor of Health Science degree program at the bachelor's level, or they may complete these courses on a postbaccalaureate level before starting the M.O.T. program. Students are only admitted into the M.O.T. program in summer term and graduate at the end of the fall term after 1.33 years of full-time study (5 semesters) and 58 credits.

Admission requirements include completion of an undergraduate degree and the prerequisite course work. Three letters of reference and a letter of application are required by the Department. Additional information is available at http://www.phhp.ufl.edu/ot/ and http://gradschool.rgp.ufl.edu or by telephone (352)273-6817.

This program is accredited by the Accreditation Council for Occupational Therapy Education (ACOTE) of the American Occupational Therapy Association. The address for ACOTE is 4720 Montgomery Lane, Box 31220, Bethesda, MD, 20814-1220. The phone number is (301) 652-2632. Graduates of the program are eligible to sit for the national certification exam administered by the National Board for Certification in Occupational Therapy (NBCOT).

The website address of NBCOT is www.nbcot.org.

OTH 5002: Foundations of Occupational Therapy(3) Foundations, development, and professional ethics, values and responsibilities of profession.
OTH 5113C: Practicum in Applied Therapeutic Activities (1) Occupational therapy activity programs in community projects.
OTH 5115C: Therapeutic Skills II: Areas of Occupation (3) *Prereq: OT graduate student.* Pre-activity and activity techniques for participation in human occupation.
OTH 5324: Psychosocial Intervention (4) *Prereq: OT graduate student.* Historical and current models for application of occupational therapy to psychosocial problems.
OTH 5435: Therapeutic Skills I(2) *Prereq: Basic skills in assessment and intervention with biomechanical factors. Intended for OT graduate students.* Addresses the evaluation and treatment of biomechanical factors in Occupational Therapy.
OTH 5726C: Service Delivery and OT Management(2) *Prereq: OT graduate status.* Basic principles of management and systems in providing occupational therapy to individuals and organizations.
OTH 5770C: Critique of Occupational Therapy Research (3) *Prereq: OT graduate student.* Principles and skills necessary for critical review of the occupational therapy literature.
OTH 5812: Practicum I (2) *Prereq: OT graduate student.* Initial practicum site experience to aid socialization process into roles and styles of occupational therapists.
OTH 5816: Practicum II (3) *Prereq: OT graduate student.* Second of series designed to acquaint future professionals with practice skills such as documentation and activity analysis.
OTH 5848: Internship I (6) Initial full-time experience under direct supervision of licensed occupational therapist. S/U.
OTH 5849: Internship II (6) Second full-time experience under direct supervision of licensed occupational therapist. S/U.
OTH 6008: Neuroscience of Human Occupation(6) Theoretical explanations of occupation in human functioning. Contemporary concepts of brain function that support occupation with emphasis on sensory, motor, and cognitive processes.
OTH 6106: Assistive Technology and Occupational Performance(6) Technology and strategies to support health and performance of daily occupations and to foster independent living and risk/injury reduction. Lifestyle and health consulting.
OTH 6275: Wellness and Disease Prevention of Chronic Conditions: Application in Occupational Therapy (3) Vascular, nerve, and orthopedic disorders, tumors and trauma physiology and pathophysiology, and occupational therapy prevention and intervention.
OTH 6424: Application of Motor Learning and Motor Control in Occupational Therapy (3) Review of neuroanatomy and musculoskeletal fundamentals of motor control. Discussion of acquisition and teaching of motor tasks to patient populations who suffer from motor control problems.

OTH 6425L: Relation of Body Image and Perceptual Dysfunction to Occupation (2-3; max: 3) *Prereq: registered occupational therapist or consent of instructor.*
OTH 6539: Occupational Therapy Theory (3) Preparation for entry-level position through introduction of basic principles of management and systems.
OTH 6635: Principles of Occupational Therapy Screening and Evaluation I (3) Introduction to principles of tests and measurement and outcomes-based assessment relevant to infants, children, and adolescents.
OTH 6636: Principles of Occupational Therapy Screening and Evaluation II(4) *Prereq: OTH 6635.* Builds on OTH 6635. Application of screening and evaluation principles to evaluation process and learning to administer tools to adult population.
OTH 6641: Occupational Therapy Interventions I(4) Occupational therapy theory and treatment as it relates to infants, children, adolescents, and their families.
OTH 6642: Occupational Therapy Interventions II(6) *Prereq: OTH 6641.* Basic interventions for adults through elders using ICIDH systems as framework. Planning and applied treatment approaches including acquisition, restorative, and compensatory strategies.
OTH 6707: OT Manager(6) Leadership development, developing independent practice for consultation, client and professional advocacy, case management, and business entrepreneurship.
OTH 6708: Issues in Occupational Therapy Practice I(2) Current health care issues.
OTH 6709: Issues in Occupational Therapy Practice II (2) Forum for debating viewpoints regarding current practice issues relevant to occupational therapy.
OTH 6720: Trends and Issues in Health Care(6) Managed health care, public policy, and intervention within social and behavioral contexts. Effects on occupational therapy service delivery.
OTH 6750: Single System Design (2) *Prereq: OTH 4935/5702/5770C.* Single system design and its application to occupational therapy programmatic research.
OTH 6760C: Protocol for Occupational Therapy (3) *Prereq: graduate-level statistics course.* Individual instruction in protocol design for research projects; procedures for submitting research to appropriate human participation review bodies. S/U.
OTH 6763: Evidence Based Practice(6) Concepts and strategies for assessment of practice outcomes and program evaluation.
OTH 6765: Seminar in Occupational Therapy Theory(4) Review of work of major occupational therapists. Theoretical perspectives include occupation-based theories and theories of Reilly, Fidler, Mosely, Llorens, Ayres, Kielhofner, and Allen.
OTH 6771: Applied Research I(2) Introduction to qualitative research methods.
OTH 6772: Applied Research II(2) *Prereq: OTH 6771.* Continuation of OTH 6771. Experience with integral components of research, data collection, and research writing.
OTH 6780: Applied Research in Occupational Therapy (3)

Prereq: OTH 6771. Continuation of OTH 6771 with emphasis on completion of a research project and its oral and written dissemination. S/U.

OTH 6861: Specialty Internship (2-9; max: 9) *Prereq or coreq: OTH 6780.* Field experience in clinical, community, educational, and administrative settings approved by the department. S/U.

OTH 6905: Individual Work (1-10; max: 10) Project related to teaching, research, administration, or clinical practice.

OTH 6907: Professional Development Project(6) Concepts and strategies for assessment of practice outcomes and program evaluation. Independent design, implementation, and reporting of an independent project.

OTH 6933: Special Topics in Occupational Therapy (2-9; max: 9) Selected topics in theory and research in occupational therapy.

OTH 6971: Research for Master's Thesis (1-6) S/U.

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Oral Biology

College of Medicine

Graduate Faculty

Chair: R. A. burne. *Graduate Coordinator:* J. Brady . *Complete faculty listing by department*: Follow this link

The Department of Oral Biology, a unit of the College of Dentistry, offers graduate study leading to the degree of Doctor of Philosophy as part of the College of Medicine's Interdisciplinary Program (IDP) in Biomedical Sciences. The work is designed to provide the degree candidate with a strong background in basic biological principles relevant to the various subspecialties of oral biology, as well as specialized training in various aspects of the diseases and disorders of the oral cavity.

Areas of emphasis include application of microbiological, immunological, cellular, and molecular biological concepts and technologies to answer questions about host-pathogen interactions in oral disease; vaccine development; oral microbial physiology; oral bacterial biofilm biology; saliva and salivary gland biology; microbial antibiotic resistance; and autoimmune diseases. More information is available at http://www.dental.ufl.edu/offices/oral-bio/.

Prerequisites for admission in addition to those of the Graduate School include a broad base of courses in mathematics, physics, organic and analytic chemistry, advanced biology, biochemistry, molecular biology, and statistical methods. Specific requirements can be obtained from the Graduate Coordinator or the IDP office.

GMS 6039: Bacterial Pathogenesis (1) *Prereq: consent of*

instructor. Survey of medical microbiology, focusing on the genetics and physiology of bacteria, their use as research tools, and the role of bacteria in causing disease.

GMS 6040: Host-Pathogen Interactions (1) *Prereq: consent of instructor.* Survey of medical microbiology, focusing on the host response and subsequent evasion of that response by pathogens.

GMS 6160: Introduction to Oral Biology I (2) Review of basic principles of prokaryotic and eukaryotic molecular biology, gene therapy, stem cell biology, and tissue engineering and the application of those principles to study of normal and abnormal conditions of oral cavity.

GMS 6161: Introduction to Oral Biology II (2) *Prereq: GMS 6160 or consent of instructor.* Review of current information on psychophysiology and biology of oral pain; oral infectious diseases; oral ramifications of inflammation, hypersensitivities, and immune deficiencies; bone disorders; and oral health in normal aging.

GMS 6173: Stomatognathic System: Form and Function (2) Anatomy and function of head and neck muscles, temporomandibular joints, and salivary glands. Normal and abnormal mastication, deglutition, speech, and oral sensorimotor measures.

GMS 6176: Biology of Tooth Supporting Structures I (1) *Coreq: BCH 6740 or consent of instructor.* Organization, vasculature, and innervation of the periodontium; chemistry; biosynthesis, biophysics, and degradation of collagen; studies of other associated, unique proteins.

GMS 6177: Biology of Tooth Supporting Structures II (1) *Prereq: GMS 6176; or consent of instructor. Coreq: BCH 6207.* Development and function of the periodontal ligament; organization, development, biophysics, and biochemistry of bone; calcification mechanisms and bone remodeling; effects of hormones and nutrients on bone.

GMS 6193: Research Conference in Oral Biology (1 or 3; max: 8) *Required of graduate students in oral biology; open to others by departmental approval.* Critical discussion and appraisal of current research in the department by students and faculty. S/U.

GMS 7179: Journal Colloquy (1; max: 8) Critical presentation and discussion of recent original journal articles in the oral biology literature.

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Pathology, Immunology, and Laboratory Medicine

College of Medicine

Graduate Faculty

Chair: M. J. Clare-Salzler. *Graduate Coordinator:* W.T. McCormack.
Complete faculty listing by department: Follow this link

The Graduate Faculty of the Department of Pathology, Immunology, and Laboratory Medicine participate in the interdisciplinary program (IDP) in medical sciences, leading to the Doctor of Philosophy degree, with specialization in one of the six advanced concentration areas of the IDP (see *Medical Sciences*). Departmental areas of research associated with the IDP include cellular and molecular immunology, autoimmunity, immunogenetics, immunochemistry, immunopathology, immunology of infectious diseases, tumor biology and virology, membrane biochemistry, molecular biology, hepatobiliary pathobiology, and comparative and nutritional pathology.

The degree concentrations associated with the IDP emphasize basic research, whereas the specializations in clinical immunology, and clinical virology emphasize laboratory training for management and supervision of clinical laboratories. Careers in pathology offer a diversity of opportunities: basic research in immunology or pathology, service in diagnostic laboratories, and teaching. In addition to courses associated with the IDP, the Department of Pathology, Immunology, and Laboratory Medicine also offers a variety of other courses, listed below.

GMS 6031: Molecular Immunology (1) *Prereq: GMS 6001, 6006, or consent of instructor.* Biological and biochemical aspects, focusing

on molecular events critical to development of an immune response.
GMS 6032: Mechanisms of Host Defense (1) *Prereq: GMS 6001, 6006, or consent of instructor.* Biological and biochemical aspects of immunology, focusing on effector mechanisms of immune response to microbes and macromolecules.
GMS 6033: Immunity in Health and Disease (1) *Prereq: GMS 6001, 6006, or consent of instructor.* Biological and biochemical aspects of immunology, focusing on the molecular and cellular basis of human disease.
GMS 6140: Principles of Immunology (3) *Prereq: GMS 6001 or consent of instructor.* Biological and biochemical aspects of host resistance and immunity. Chemical and physiochemical properties of the proteins of immune reactions.
GMS 6331: Stem Cell Biology(1) *Prereq: GMS 6001 or consent of instructor.* Recent progress in mammalian stem cell research.
GMS 6335: Advanced Stem Cell Biology: Tissue Engineering (1) *Prereq: GMS 6331 and GMS 6336* Current state of the art in using stem cells and other technologies to engineer tissues and organs for therapeutic use.
GMS 6336: Advanced Stem Cell Biology: Regenerative Medicine (1) *Prereq: GMS 6331.* Potential clinical applications of tissue-specific, adult stem cells; derivation, manipulation, uses, and limitations.
GMS 6381: Special Topics in Pathology (1-4; max: 12) *Prereq: departmental approval.* Conference and supervised laboratory work. Topics selected to meet each student's needs. Offered in even-numbered years.
GMS 6382: Special Topics in Immunology (1-3; max:6) *Prereq: GMS 6140 or consent of instructor.* Analysis and discussion of contemporary topics in development of current concepts. Evaluation of the most recently published research literature. Seminars and discussions with invited speakers.
GMS 6394: Seminar in Mammalian Genetics (1; max:12) Research report given by invited speakers, genetics faculty, and graduate students. S/U.
GMS 6921: Immunology/Microbiology Journal Colloquy (1; max: 12) *Prereq: GMS 6001, 6006, or consent of instructor.* Critical presentations and discussions of recent original articles.
GMS 6xxxO: Cellular and Molecular Basis of Kidney Diseases (1) *Prereq: GMS 6001 or consent of instructor.* Integration of basic and clinical research related to cellular and molecular pathogenesis of kidney diseases.
GMS 6xxxS: Cellular and Molecular Basis of Liver Diseases (1) *Prereq: GMS 6001 or consent of instructor.* Integration of basic and clinical research on cellular and molecular pathogenesis of liver diseases.
GMS 7191: Research Conference (1; max: 12) Critical discussion and appraisal of research programs of faculty and students of the department. S/U.

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Pharmaceutical Outcomes and Policy

College of Pharmacy

Graduate Faculty

Chair: R. Segal. *Graduate Coordinator:* C. L. Kimberlin.
Complete faculty listing by department: Follow this link

The Department offers the Master of Science in Pharmacy and Doctor of Philosophy degrees in pharmaceutical sciences with a concentration in pharmaceutical outcomes and policy. Requirements for the M.S.P. degree are the same as for the Master of Science degree. Complete descriptions of the requirements for these degrees are provided in the *General Information* section of this catalog.

Research in the Department emphasizes the epidemiological, socio-behavioral, administrative, legal, and economic aspects of drug therapy and pharmaceutical services, including assessment of safety, effectiveness, and efficiency aspects of patient-oriented pharmaceutical services.

Graduate studies include core curricula encompassing the drug use process, statistics and research design, behavioral sciences, epidemiology, and economics. Electives and required courses draw from the resources of the entire University. They provide necessary concepts, knowledge, and skills for practical problem-solving and basic research. Graduates are prepared for leadership positions in academia, public service, pharmaceutical industry, and practice management related to drug therapy and pharmacy practice.

Applicants with backgrounds in pharmacy, nursing, other health professions, or behavioral sciences are welcomed. Admission to the

graduate program does not require a degree in pharmacy or another health profession although some familiarity with health care and health professions is recommended.

A graduate student whose native language is not English must take a spoken English test in order to hold a state-funded assistantship. These spoken English tests include the Test of English as a Foreign Language Internet Based Test (TOEFLiBT), the International English Language Testing System (IELTS), the Michigan English Language Assessment Battery (MELAB) including the optional speaking test, or successful completion of the English Language Institute at the University of Florida.

PHA 5270: Health Care and Patient Safety (3) Provides an overview of applicable federal, state, local, and health and safety laws relevant to the practice of health care risk management and patient safety.
PHA 5271: Health Care Risk Management (3) Introduction to the concept of risk management in health care settings, describing its development, role of the health care risk manager, and connection between risk management, quality improvement and corporate compliance.
PHA 5272: Risk Management, Liability and Compliance (3) Applicable standards of health care risk management, including the principles of malpractice and insurance, the conduct of malpractice litigation, and the settlement of malpractice claims.
PHA 6227: Institutional Pharmacy Leadership I(3) Addresses leadership topics relevant to institutional pharmacy with an emphasis on case study analysis. Topics include leading people, leading the pharmacy enterprise, leading change and innovation, providing leadership in safety and quality, and information technology and systems. S/U.
PHA 6228: Institutional Pharmacy Leadership II(3) Addresses leadership topics relevant to institutional pharmacy with emphasis on case-study analysis. Topics include leadership in effective financial management, building presence with executive leadership, leading for results, and gaining leadership skills through self-development. S/U.
PHA 6236: Health Sciences Liability Law (2) Liability of health sciences practitioners, including hospitals, physicians, pharmacists, nurses, medical technologists, and dentists.
PHA 6250: The Patient in the Drug Use Process (3) Psychological theoretical foundations of research on the patient's role in health care and drug use. Critique of research evaluating the role of the patient.
PHA 6264: Pharmacoeconomics and Health Technology Assessment (3) *Prereq: STA 6200 or 6126 or equivalent, HSC 6507 or 5103 or equivalent, or consent of instructor.* Introduction to major analytical techniques used in economic evaluation of medical

technologies.

PHA 6265: Introduction to Pharmaceutical Outcomes and Policy I(3) Introduces students to the breadth of research issues in Pharmaceutical Outcomes and Policy, including legal, educational, regulatory and financial aspects of medication use; patient and provider behavior in medication use; the structure of pharmaceutical supply chain; and patient safety and risk management.

PHA 6266: Introduction to Pharmaceutical Outcomes and Policy II(2) Introduction to drug distribution systems, pharmacoepidemiology, economic evaluation of drugs, and databases regarding medication use.

PHA 6268: Pharmacoepidemiology and Therapeutic Risk Assessment(3) Exposure to research methodologies in pharmacoepidemiology, drug utilization, research, pharmacovigilance and therapeutic risk management. Emphasizes study design and protocol development. Current safety issues are discussed.

PHA 6269: Pharmaceutical Products and Public Policy (3) Relationships among pharmaceutical manufacturers, institutions, managed care, professions, and the public. The government's role in assuring high quality pharmaceutical products and services. Quality controls managed by the public and by industry. Congressional oversight of medication development, production, and use.

PHA 6273: Structure, Process, and Outcomes of Regulation (3) The role of the legislative, executive and judicial branches of state and federal government in the establishment of standards for pharmacy practice and drug distribution. Special emphasis on the administrative rule making process. The purpose of government agencies, the approach to standards setting by each type of agency, and the effects of regulation on public health.

PHA 6274: Federal Regulations of Drugs and Pharmacy (3) The Federal Food, Drug and Cosmetic Act, regulations promulgated by the Food and Drug Administration, and judicial interpretations of controversies in this area. Federal regulation of drug research, new drug approval, drug marketing and drug distribution. The balance sought by the FDA and other federal agencies in the protection of the public from unsafe and/or ineffective drugs, without unnecessarily restricting access to therapies.

PHA 6275: Federal Regulations of Controlled Substances (3) The Federal Controlled Substances Act, regulations promulgated by the Drug Enforcement Administration, and judicial interpretations of controversies in this area. The "closed-system" of controlled substance distribution created under federal law. Federal restrictions on the manufacture, distribution and use of drugs that are subject to abuse. Treatment programs for the disease of addiction.

PHA 6276: Regulating Pharmaceutical Access and Costs (3) Regulation to expand access and control costs of health care. The obligation to provide care. State and federal regulation of private health insurance and managed care. Implications of EMTALA, ERISA, HIPAA, and COBRA. Introduction to Medicare and Medicaid. Technology assessment, drug pricing and price controls. Intellectual property protections and market exclusivity periods.

PHA 6277: Ethics in Drug Development Production and Use (3) Governments, health professionals, patients and research institutions look to the field of ethics for guidance on how decisions should be made in the treatment of patients and in research. A process for ethical decision making. Basic theories and principles of biomedical ethics, with emphasis on utilitarianism. Application of principles to subjects such as informed consent, abortion/contraception, physician-assisted dying, experimentation with human subjects, and confidentiality.

PHA 6278: State Regulation of Drugs and Pharmacy (3) State, federal, and nongovermental regulation of health care professions and practice sites. Regulatory responses to professional misconduct. Role of professional self-regulation. Consumerism and state regulation.

PHA 6279: Pharmaceutical Outcomes and Policy Seminar (1; max: 3) Development, reasons for, and possible approaches to resolving a contemporary issue in health outcomes or policy. Students analyze particular aspects of the issue and present results for class discussion. S/U.

PHA 6286: Pharmaceutical Microeconomics (3) Introduction to basic microeconomic principles as they are applied to pharmaceuticals. Elucidation of the economic tools and the fundamental concepts of choice, opportunity costs, supply and demand, elasticity, utility maximizing behavior, competition, monopolies and oligopolies in the healthcare market.

PHA 6287: Pharmaceutical Health Economics(3) Examines economic principles and issues of health care and pharmaceuticals in the United States. Topics examined include health care structure and financing, market failures, human capital, and producer and consumer behavior.

PHA 6288: Critical Review of Research Methods(3) Research design and methodology utilized in clinical research with a focus on understanding each component of the research process, including how to formulate a research question, develop hypotheses, analyze instruments, collect relevant data, data analysis, and critically interpret the results, while preserving the ethical guidelines for human subject research.

PHA 6289: Regulating Clinical Research(3) Introduces history and current regulatory environment of human subjects research as a background to regulatory frameworks and contemporary issues structuring the development of clinical medical research, including federal regulations of Departments of Health and Human Services and those of the Food and Drug Administration, as well as non-federal sources of regulation.

PHA 6291: Pharmaceutical Health Care Systems (3) Emphasizes designing a prescription benefit program meeting the needs of a reformed health care system; negotiating the health care system as the advocate for patients who are from special populations; and presenting to lawmakers a compelling argument for reform.

PHA 6717: Measurement in Pharmacy Administration

Research (3) *Prereq: STA 6217 or equivalent.* Examination of some of the techniques adapted from the social sciences for research in the field of pharmacy administration.

PHA 6796: Study Design in Pharmaceutical Outcomes & Policy Research (3) Methods for evaluation and improvement of drug therapy outcomes including critical appraisal of drug and clinical service literature with special focus on patient and medication safety.

PHA 6805: Applied Data Interpretation and Reporting of Findings in Pharmacy (3) Develops research skills including generation of questions; hypotheses testing; and testing, interpretation, and reporting of findings.

PHA 6860: Prevention of Pharmaceutical Crimes (3) Introduces the student to the current legal environment associated with criminal conduct related to the use of pharmaceutical products and strategies for reducing the risk that pharmaceutical products will be used to intentionally harm a person as the instrumentality of a criminal act, including actions by a health care provider that can be considered criminal and outside the practice of health care.

PHA 6937: Topics in Pharmaceutical Administration (2) Analysis of special topics and recent developments in pharmaceutical administration, including innovations in the distribution of drugs and health-care services.

PHA 6xxxA: Medicare and Medicaid (3) Costs and financing of Medicare and Medicaid. Eligibility, program administration, benefits, and relationships between state and federal agencies.

PHA 6xxxB: Practices and Procedures of Administrative Agencies (3) Organization, responsibilities, administrative practices, procedures, and politics of FDA and CMS.

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Pharmaceutical Sciences--General

College of Pharmacy

Dean: W. Riffee.

The College of Pharmacy offers the Doctor of Philosophy and the Master of Science in Pharmacy degrees in the pharmaceutical sciences, with concentrations in medicinal chemistry, pharmacodynamics, pharmaceutical ooutcomes and policy, and pharmacy which includes pharmaceutics. There are two additional concentrations in the Master of Science in Pharmacy program in pharmaceutical sciences: forensic drug chemistry, and forensic serology and DNA. Both offered in a distance-learning, nonthesis format.

Complete descriptions of the minimum requirements for the M.S.P. and Ph.D. degrees are provided in the *General Information* section of this catalog.

The Graduate Faculty and courses offered are listed under department headings in this catalog. The courses listed below consist of seminar, supervised teaching and research, and research for thesis or doctoral dissertation. These courses are offered in each of the departments.

Students who wish to pursue graduate studies in the College of Pharmacy must have an undergraduate degree in pharmacy, chemistry, biology, or related sciences.

Satisfactory completion of a thesis or dissertation based on research is a requirement for a graduate degree in the pharmaceutical

sciences.

Inquiries regarding applications and general information about the graduate programs are processed through the Office of Research and Graduate Studies, College of Pharmacy, P.O. Box 100484, Health Science Center.

PHA 5625: Pharmaceutical Industry Practical Training Externship (2-6; max: 12) *Prereq: 1 semester of didactic graduate program or 1 year of professional program.* Work experience in pharmaceutical industry setting.
PHA 6910: Supervised Research (1-5; max: 5) S/U.
PHA 6935: Selected Topics in Pharmacy (1-4; max: 12) Open to all departments in the College of Pharmacy.
PHA 6936: Advanced Topics in Pharmaceutical Sciences (1; max: 4) Written and oral presentation of research designs, protocols, papers, and critical appraisals with discussion and critical review of such topics.
PHA 6938: Research Seminar (1; max: 3) Seminar required of graduate students in the College of Pharmacy.
PHA 6940: Supervised Teaching (1-5; max: 5) S/U.
PHA 6971: Research for Master's Thesis (1-15) S/U.
PHA 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
PHA 7980: Research for Doctoral Dissertation (1-15) S/U.

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Pharmaceutics

College of Pharmacy

Graduate Faculty

Chair: H. C. Derendorf. *Graduate Coordinator:* A. Palmieri III.
Complete faculty listing by department: Follow this link

The Department of Pharmaceutics offers the Doctor of Philosophy in pharmaceutical sciences. Pharmaceutics is the scientific endeavor concerned with the design, formulation, evaluation, and use of drug delivery systems. A foundation in physical chemistry, chemistry, mathematics, and in the life sciences, is necessary. Its domain extends from studies of the physiochemical properties of drugs and related molecules to investigations of the mechanisms of physiological processes affecting drug delivery and therapeutic effectiveness. The Department's general focus involves studying the design and evaluation of traditional and novel dosage forms for delivering drug molecules and macromolecules. The design involves physical chemical studies and development of analytical techniques involving spectroscopy and chromatography. Evaluation includes development of sensitive analytical techniques for the drug in biological fluids and subsequent biopharmaceutical and clinical pharmacokinetic studies.

PHA 5121: Advanced Clinical Pharmacokinetics (2)
Pharmacokinetics and pharmacodynamics of time course of drugs in body. Pharmacokinetic aspects include absorption, distribution metabolism, and elimination. Pharmacodynamic aspects include quantitative relationships between drug concentration and wanted or undesired effects. Offered spring term.
PHA 5172: Biotechnology and Pharmacy Practice (3) Principles

of recombinant DNA technology needed to interact and communicate as a pharmaceutical scientist in biotechnology. Recombinant peptide and protein drugs including protein purification, stability, quality control, and dosage form design. Offered fall term.

PHA 6115: Equilibria, Complexations, and Interactions of Drugs (3) Models for drug interactions in solution. Physical chemistry characteristics of drugs and their complexes in pharmaceutical systems.

PHA 6116: In Vivo and In Vitro Stability of Drugs (3) Effects of various disease states, age, genetic differences, stress, nutrition, and drug interactions on drug metabolism. Offered fall term in even-numbered years.

PHA 6118: Molecular Diversity (2) Combinatorial and high throughput methods to generate leads for drug discovery and accelerated drug development.

PHA 6125: Pharmacokinetics and Biopharmaceutics (3) Compartmental analysis with computers. Offered spring term in even-numbered years.

PHA 6170C: Pharmaceutical Product Formulation (3) Rationale and design of pharmaceutical dosage forms. Offered fall term in odd-numbered years.

PHA 6183: Pharmaceutical Gene Delivery (3) Designed for graduate students researching gene delivery. Lectures on vector design and construction including review of related molecular biology and cell biology. Lectures on gene delivery systems (both viral and nonviral vectors) and their applications. Recent progress of gene therapy for human diseases including student presentations. Offered in odd-numbered years.

PHA 6185: Pharmaceutical Drug Development (3) *Prereq: consent of instructor. Open to graduate students and advanced Pharm.D. students.* Drug development from discovery to post-market surveillance. Good manufacturing process (GMP), good clinical practice (GCP), and good laboratory practice (GLP); intellectual property, regulatory agencies, generic approvals, and case studies.

PHA 6416: Pharmaceutical Analysis I (3) Theory and applications of relevant analytical techniques for analysis of drugs in biological samples. Offered spring term in odd-numbered years.

PHA 6427: Pharmacogenetics of Drug Metabolism(2) Examination of factors that affect drug disposition and response including genetics, as well as, additional factors such as environment, diet, age, and concurrent drug therapy and health status. Students will acquire an understanding of pharmacogenetics/pharmacogenomics in the context of variability in drug disposition and the application of pharmacogenetics to drug development and drug treatment.

PHA 6440: Seminar in Drug Discovery (1; max: 8) Weekly presentations of research topics related to drug design and discovery. S/U option.

PHA 6449: Pharmacogenomics (2) *Prereq: biochemistry, PHA*

6425, or consent of instructor. Contemporary experimental approaches in pharmacogenomics research design.

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Pharmacodynamics

College of Pharmacy

Graduate Faculty

Chair: M. K. Wood. *Graduate Coordinator:* M. J. Katovich. *Complete faculty listing by department*: Follow this link

The Department of Pharmacodynamics offers the Doctor of Philosophy in the pharmaceutical sciences with a concentration in pharmacodynamics. The Department participates in the interdisciplinary toxicology concentration (see *Interdisciplinary Graduate Studies* in this catalog). Pharmacodynamics is an integrated field of study involving pharmacology, physiology, and toxicology in a holistic approach to drug action in living systems. The Department focuses on neuroendocrinology, cardiovascular pharmacology, and neuropharmacology with diverse research interests in aging, hypertension, reproduction, glaucoma, neurotoxicity, and environmental physiology.

An undergraduate degree in pharmacy, chemistry, biology, or related sciences is required. In addition to graduate courses in pharmacy, courses are taken in the College of Medicine and in statistics in the College of Liberal Arts and Sciences.

GMS 6403: Advanced Endocrinology (4) *Prereq: GMS 6400C, PHA 3500, 3501 or equivalent, consent of instructor.* Readings discussions, and lectures on recent advances in endocrinology.
PHA 5531: Neurotoxicology (2) *Prereq: biochemistry, physiology, and consent of instructor.* Survey of major classes of agents known to cause toxic effects in central and peripheral nervous systems. Compounds' mechanism of action. Experimental techniques for

evaluating neurotoxicity.

PHA 6512L: Experiential Research Training in Pharmacodynamics (2-6; max: 6) *Prereq: PHA 6521C.* Research rotations. Practical overview of hypothesis development and testing, research design and application of statistical analysis.

PHA 6521C: Research Techniques in Pharmacodynamics (3; max: 12)

PHA 6522L: ICBR Molecular Techniques Laboratory (2) S/U.

PHA 6540: Neurochemical Foundation of Pharmacodynamics (3) Introduction to neurochemical mechanisms involved in drug action. Overview of neurotransmitter biochemistry along with receptor pharmacology. Emphasis on both methodological and theoretical aspects of neurotransmitter metabolism and function.

PHA 7939: Journal Colloquy in Pharmacodynamics (1; max: 8) Critical presentation and discussion of recent original articles.

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Pharmacology and Therapeutics

College of Medicine

Graduate Faculty

Chair: S. P. Baker. *Graduate Coordinator:* J. K. Harrison. *Complete faculty listing by department*: Follow this link

The Graduate Faculty of the Department of Pharmacology and Therapeutics participate in the interdisciplinary program (IDP) in medical sciences, leading to the Doctor of Philosophy degree, with specialization in one of the six advanced program areas of the IDP (see *Medical Sciences*). Departmental areas of research associated with the IDP include receptor and membrane pharmacology; signal transduction; endocrine and neuropharmacology; aging and obesity; cancer chemotherapy and carcinogenesis; physical chemistry of enzymes; drug metabolism; environmental toxicology and cellular protein processing. In addition to courses associated with the IDP, the Department of Pharmacology and Therapeutics offers the courses listed below.

GMS 6500: Introduction to Pharmacology (6) *Prereq: elementary courses in biochemistry and physiology.* Overview of the field of pharmacology as study of interactions between living systems and foreign chemicals.
GMS 6563: Molecular Pharmacology (1; max: 3) *Prereq: GMS 6009 or consent of instructor.* Biochemical approach to the actions of drugs, stressing analysis of drug-receptor interactions, structure-activity relationships, kinetics of distribution of drugs, and metabolism of foreign compounds.
GMS 6590: Seminar in Pharmacology (1; max: 15) *Prereq: GMS 6500.* Research reports and discussions of current research

literature by graduate students, faculty, and invited lecturers.

GMS 6592: Ion Channels Journal Club: Pharmacology, Biophysics, and Neuroscience of Excitable Membranes (1) *Prereq: consent of instructor.* Recent papers in the context of larger issues in therapeutics and neuroscience. Discussions led by students and faculty. S/U.

GMS 6735: Neuropharmacology (1; max: 3) *Prereq: GMS 6007, 6009, or consent of instructor.* Identification, synthesis, metabolism, and pharmacology of neurotransmitters and their receptors. Includes biogenic amines, neuropeptides, and other nervous system transmitters.

GMS 7593: Topics in Pharmacology and Toxicology (1-3; max: 12) Seminars, informal conferences, or laboratory work on selected topics.

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Philosophy

College of Liberal Arts and Sciences

Graduate Faculty

Chair: R. D. Amico. *Graduate Coordinator:* C. Liu. *Complete faculty listing by department*: Follow this link

The Department offers the Master of Arts and Doctor of Philosophy degrees. Requirements for these degrees are given in the General Information section of this catalog.

Admission to the program requires a bachelor's degree in philosophy or sufficient course work in philosophy, as determined by the department. Applicants are evaluated on the basis of academic achievement, GRE scores, three letters of recommendation, a statement of purpose, and a sample essay in philosophy. Students may be admitted as for a terminal M.A. degree or for the Ph.D. Program.

The M.A. degree requires two years of course work. All graduate students take foundational courses in their first four semesters in Philosophical Methods (PHI 5935), The History of Philosophy (PHH 5405 or PHH 5406; PHP 5005 or PHP 5015), Logic (PHI 5135), and Analytic Philosophy (PHP 5785) or Epistemology (PHI 5365). One research seminar is required for the M.A. and six for the Ph.D. In addition to the foundational courses required for the M.A., the Ph.D. requires a course in ethics (PHI 5665) and both PHP 5785 and PHI 5365.
Further information about the department's programs and admissions can be obtained on the department's website or by contacting the Graduate Coordinator, 330 Griffin-Floyd Hall,

(352)392-2084 or gradcoord@phil.ufl.edu.

PHH 5405: Modern Philosophy I (3) Close reading of central text of the rationalists in the early modern period, especially Descartes, Spinoza, and Leibniz.
PHH 5406: Modern Philosophy II (3) Close reading of central texts of the empiricists in the modern period, especially Locke, Berkeley, and Hume.
PHH 5605: Studies in Continental Philosophy (3) Close reading of central texts of the major figures in the European continental tradition, such as Husserl, Heidegger, and Sartre.
PHH 6105: Seminar in Ancient Philosophy(3; max: 18) *Prereq: PHP 5005 or 5015, depending on topic.* Advanced study of particular topics or themes in the philosophy of Greek and Roman antiquity.
PHH 6425: Seminar in Modern Philosophy (3; max: 18) *Prereq: PHH 5406 or consent of instructor.* Advanced study of particular topics or themes in philosophy of the seventeenth and eighteenth centuries. S/U option only if admitted to candidacy. S/U option.
PHI 5135: Graduate Logic (3) Propositional calculus, quantificational logic through completeness, and an introduction to modal logic.
PHI 5225: Philosophy of Language (3) Advanced survey of central issues in contemporary philosophy of language, such as the theory of meaning, compositionality, reference, truth, and logical form.
PHI 5325: Philosophy of Mind (3) Advanced survey of central issues in contemporary philosophy of mind, such as approaches to the mind-body problem, theories of mental content and consciousness, mental causation, and methodology in psychology.
PHI 5365: Epistemology (3) Advanced survey of central issues in contemporary epistemology such as major theories of knowledge, justification, and truth.
PHI 5405: Philosophy of Science (3) Advanced survey of central issues in the philosophy of science, such as the nature of the scientific method, and the differences between the natural and social sciences.
PHI 5425: Philosophy of Social Science (3) Advanced survey of the central issues in the philosophy of social science, such as reduction, covering laws, rational reconstruction, interpretation, and causation.
PHI 5505: Metaphysics (3) Advanced survey of issues in contemporary metaphysics, such as existence, identity, universals and abstract objects, the nature of particulars, modalities, and causation.
PHI 5665: Ethical Theory (3) Advanced survey of central issues in ethical theory, such as consequentialism and deontology, theories of justice, and moral skepticism.
PHI 5905: Individual Work (1-6; max: 6) *Prereq: Consent of instructor, graduate coordinator, and chair.* Problem, author, or topic not treated in available courses.
PHI 5934: Topics in Philosophy (3; max: 18) Rotating topics

may focus upon any area of philosophy not covered by other 5000-level courses.

PHI 5935: Proseminar (3) Mandatory for entering students. Methods of inquiry and research. S/U.

PHI 6105: Seminar in Logic (3; max: 18) *Prereq: PHI 5135.* Advanced seminar in logic, covering topics in model theory and recursion theory, beyond level of PHI 5135, including a careful treatment of Godel's incompleteness theorems and a modest study of undecidability. S/U option available if student admitted to Ph.D. candidacy. S/U option.

PHI 6226: Seminar in Philosophy of Language (3; max: 18) Advanced study of particular topics or themes in the philosophy of language, such as compositionality, pragmatics, speech act theory, semantics of attitude reports or deflationary theories of truth. S/U option available if student admitted to Ph.D. candidacy. S/U option.

PHI 6306: Seminar in Epistemology (3; max: 18) *Prereq: PHI 5365 or PHP 5785.* Advanced study of particular topics in epistemology, such as epistemic justification, skepticism, or foundationalism. S/U option available if student admitted to Ph.D. candidacy. S/U option.

PHI 6326: Seminar in Philosophy of Mind (3; max: 18) Advanced study of particular topic or theme in philosophy of mind, such as theories of mental representation, the mind-body explanatory gap, nativism, or the problem of mental causation. S/U option available if student admitted to Ph.D. candidacy. S/U option.

PHI 6406: Seminar in Philosophy of Science (3; max: 18) *Prereq: PHI 5136 and 5405.* Advanced study of particular topics or themes in the philosophy of science, such as the scientific explanation, laws, and theories of space and time. S/U option available if student admitted to Ph.D. candidacy. S/U option.

PHI 6506: Seminar in Metaphysics (3; max: 18) Advanced study of particular topics or themes in contemporary metaphysics, such as identity, Platonism and nominalism, the nature of particulars, necessity and possibility, events and facts, and the nature of causation. S/U option available if student admitted to Ph.D. candidacy. S/U option.

PHI 6667: Seminar in Ethics (3; max: 18) Advanced study of particular topics or themes in ethical theory, such as noncognitivism, moral realism, virtue ethics, and consequentialism. S/U option available if student admitted to Ph.D. candidacy. S/U option.

PHI 6787: Seminar in Continental Philosophy (3; max: 18) *Prereq: PHH 5505, 5406, or 5405.* Advanced study of particular topics or figures of the 20th-century continental tradition. S/U option available if student admitted to Ph.D. candidacy. S/U option.

PHI 6905: Individual Work(1-9; max: 9) *Prereq: Consent of instructor, graduate coordinator, and chair.* Advanced study of author or topic not treated in available courses.

PHI 6910: Supervised Research (1-5; max: 5) S/U.

PHI 6934: Special Topics (1-4; max: 18) Special research topics falling outside of the scope of other research seminars. S/U option available if student admitted to Ph.D. candidacy. S/U option.

PHI 6940: Supervised Teaching (1-5; max: 5) S/U.
PHI 6971: Research for Master's Thesis (1-9) S/U.
PHI 7979: Advanced Research (1-12) *Prereq: consent of the graduate committee.* Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
PHI 7980: Research for Doctoral Dissertation (1-12) S/U.
PHP 5005: Ancient Philosophy I (3) Examination of central themes in Plato's thought through close reading of several major dialogues.
PHP 5015: Ancient Philosophy II (3) Historical and critical study of major aspects of Aristotle's logic, epistemology, physics, metaphysics, and philosophy of mind, through a close reading of central texts.
PHP 5785: Foundations of Analytic Philosophy (3) Foundational readings in analytic philosophy from Frege to Quine.
PHP 6415: Seminar in Kant (3; max: 18) *Prereq: PHH 5406 or consent of instructor.* Intensive examination of the first *Critique* and selections from other major works. S/U option available if student admitted to Ph.D. candidacy. S/U option.
PHP 6795: Seminar in Analytic Philosophy (3; max: 18) Advanced study of the work of a particular philosopher or philosophical problem from the analytic perspective. S/U option available if student admitted to Ph.D. candidacy. S/U option.
PHP 6930: Seminar in a School or Thinker (3; max: 18) Advanced study of the work of one or more, usually pre-twentieth century, thinkers. S/U option available if student admitted to Ph.D. candidacy. S/U option.

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Physics

College of Liberal Arts and Sciences

Graduate Faculty

Chair: J. M. Yelton. *Graduate Coordinator:* J. N. Fry. *Complete faculty listing by department*: Follow this link

The Department of Physics offers the Master of Science (thesis or nonthesis) and the Doctor of Philosophy degrees. The nonthesis Master of Science in Teaching is also offered. Requirements for these degrees are described in the *General Information* section of this catalog. Areas of specialization for graduate research include astrophysics and cosmology, atomic and molecular physics, biological physics, chemical physics, condensed matter physics (theory and experiment), nuclear physics, particle physics (theory and experiment), statistical physics, and low temperature physics. Special interdisciplinary research programs include the Institute for Fundamental Theory (carried out jointly with the Department of Mathematics), the Institute for Theoretical and Computational Studies in Molecular and Materials Science (carried out jointly with the Department of Chemistry), the Institute of High Energy and Particle Astrophysics, and Microfabritech (jointly with the College of Engineering). A curriculum is offered by the Center for Chemical Physics for students interested in research related to chemistry or chemical engineering. The Center for Condensed Matter Sciences provides opportunities for investigations in a diverse range of subjects and fields, including the Microkelvin Research Laboratory. The University of Florida operates the National High Magnetic Field Laboratory jointly with Florida State University and Los Alamos National Laboratory. The core curriculum is designed to provide a thorough foundation for all physics graduate students. It consists of

PHY 6246, PHY 6346, PHY 6347, PHY 6536, PHY 6645, and PHY 6646. Doctoral students must achieve a 3.30 GPA in the core curriculum. All students must pass a preliminary examination at the undergraduate level. All degree candidates are required, as part of their graduate education, to participate continuously in the research and/or teaching programs of the Department.

AST 6416: Physical Cosmology (3) Introduction to the observational background and to the theory of cosmology.
PHY 5277: Physics of Accident Reconstruction and Biomechanics (2) *Prereq: undergraduate mechanics; calculus.* Introduction, with emphasis on forces experienced in accidents and associated damage to tissue and bone.
PHY 5905: Individual Work (1-4; max: 12 including PHY 6905) *Prereq: consent of instructor.* Assigned reading and problems program, special topics, or development of special experimental or theoretical problems. Work selected according to student's needs and interests.
PHY 6246: Classical Mechanics (3) Review of Lagrangian formulation and special relativity. Hamiltonian mechanics, canonical transforms and Hamilton-Jacobi theories, action angle variables, rigid rotators, normal modes, mechanics of continuous media. Fluid mechanics.
PHY 6346: Electromagnetic Theory I (3) Electrostatics, special function expansions, magnetostatics, linear media, time dependent Maxwell theory, wave propagation and dispersion, diffraction, scattering, radiation, relativistic covariance, applications.
PHY 6347: Electromagnetic Theory II (3) *Prereq: PHY 6346.* Continuation of PHY 6346.
PHY 6536: Statistical Mechanics I (3) *Prereq: PHY 6645 and 6246.* Equilibrium ensembles for classical and quantum systems, fluctuations, applications to normal fluids, phase transitions and critical phenomena, plasmas.
PHY 6555C: Cryogenics (4) *Prereq: PHY 3101 and consent of instructor.* Production and use of cryogenic fluids; temperature measurement and control; use of cryogenics in science and industry, superconducting magnet and power generator, and electronics. Hands-on experience.
PHY 6645: Quantum Mechanics I (3) *Prereq: MAP 5304, PHY 4605.* Hilbert space, Heisenberg and Schrodinger dynamics, invariance properties and symmetry operations, spin, perturbation, and variational methods.
PHY 6646: Quantum Mechanics II (3) *Prereq: PHY 6645.* Time dependent perturbation theory, scattering theory, identical particles and second quantization, Dirac equation.
PHY 6648: Quantum Field Theory I (3) *Prereq: PHY 6646.* The Poincare group; the Dirac equation; quantization of free fields; the scattering matrix; applications.
PHY 6905: Individual Work (1-4; max: 12 including PHY 5905) Treatment of an experimental or theoretical problem or topic assigned on the basis of student's needs and interests.

PHY 6910: Supervised Research (1-5; max: 5) S/U.
PHY 6920: Departmental Colloquium (1; max: 14) Summary presentation of contemporary topics by visiting and local researchers. S/U.
PHY 6932: Seminar in Molecular and Computational Physics (1; max: 10) *Prereq: senior or graduate standing.* Invited speakers on topics of current interest in computation and theory in dynamics, and molecular and solid state physics. S/U.
PHY 6943: Internship in College Teaching (2,4,6; max: 6) *Prereq: graduate standing.* Required for Master of Science in Teaching students, but available for students needing additional practice and direction in college-level teaching.
PHY 6971: Research for Master's Thesis (1-15) S/U.
PHY 7097: Advanced Topics in Theoretical Physics (3; max: 10) Special studies in mathematical methods and applications of current interest at the forefront of one or more specialties in theoretical physics.
PHY 7669: Quantum Field Theory II (3) *Prereq: PHY 6648.* Path integral quantization; perturbation theory; renormalization; quantization of gauge fields; applications.
PHY 7939: Special Topics (2; max: 12) Assigned reading program, seminar, or lecture series in a rapidly advancing specialty of physics.
PHY 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
PHY 7980: Research for Doctoral Dissertation (1-15) S/U.
PHZ 5155C: Physical Modeling and Simulation (3) Principles and applications of physical modeling and computer simulation. Fundamental interactions among particles such as atoms, molecules, condensed matter, and planets. Introduction to variety of simulation techniques in modern research.
PHZ 5245: Introduction to Magnetic Resonance(3) *Prereq: PHY 2049 and 3101 or consent of instructor.* Elementary introduction to basic principles of magnetic resonance and its applications to nuclear magnetic resonance (NMR), electron paramagnetic resonance (EPR), ion cyclotron resonance (ICR), and magnetic resonance imaging (MRI).
PHZ 5354: Introduction to Particle Physics (3) *Prereq: consent of instructor.* Descriptive survey of particle and nuclear phenomena and states: conserved quantities and quantum numbes, invariance principles.
PHZ 5405: Introduction to Solid-State Physics (3) *Prereq: PHY 4605 or consent of instructor.* Descriptive survey of solid-state phenomena and basic methods. Crystal structure, lattice modes, electronic states, thermal, optical, and magnetic properties.
PHZ 6156: Computer Methods in Physics (2) *Prereq: elementary FORTRAN.* Numerical techniques useful in the solution of physical problems. Appropriate utilization of computation; aspects of

contemporary methods in computational physics, especially advanced version of FORTRAN.

PHZ 6166: Qualitative Methods of Theoretical Physics(3) *Prereq: PHY 6246, 6346, 6536, 6645, or consent of instructor.* Hands-on experience in formulating and analyzing theoretical problems using scaling, approximate mathematical methods, principles of symmetries, etc. Some workshops.

PHZ 6247: Chemical Physics (3) *Prereq: PHY 6645 or consent of instructor. Identical to CHM 6520.* Intermolecular forces, molecular dynamics; electromagnetic properties of molecular systems; solid surfaces; theoretical and computation methods.

PHZ 6355: Elementary Particle Physics I (3) *Prereq: PHY 6646.* Dirac and Klein-Gordon equations, Feynman diagrams, scattering amplitudes; the standard model of weak, electromagnetic, and strong interactions; phenomenology of high energy physics.

PHZ 6358: Standard Model of Elementary Particles I (3) Nonabelian gauge theory, Glashow-Weinberg-Salam model of electromagnetic and weak interactions. Spontaneous symmetry breaking and Higgs mechanism, theory of weak processes focusing on quantum corrections and their physical consequences.

PHZ 6391: Seminar in Astrophysics (1; max: 12) S/U.

PHZ 6392: Seminar in Particle Physics (1; max: 12) S/U.

PHZ 6426: Solid State I (3) *Prereq: PHY 6536.* Quantum theory of crystalline solids: Bloch theorem, electronic structure, thermodynamic and transport properties of metals, lattice dynamics, electronic interactions in solids, semiconductors and insulators.

PHZ 6493: Seminar in Condensed Matter Physics (1; max: 12) S/U.

PHZ 6607: Special and General Relativity (3) *Prereq: PHY 6246.* Special relativity, tensor analysis, covariant electromagnetism and hydrodynamics; general relativity, Riemannian geometry, gravity as curvature, exact solutions; relativistic astrophysics, cosmology.

PHZ 7357: Elementary Particle Physics II (3) *Prereq: PHZ 6355.* Continuation of PHZ 6355. Extensions of the standard model. Calculations of QCD corrections.

PHZ 7359: Standard Model of Elementary Particles II (3) *Prereq: PHZ 6358.* Strong interactions, perturbation study of quantum chromodynamics (QCD) of quarks and gluons. Chiral description of long-range QCD, supersymmetric extensions of standard model, grand unification

PHZ 7427: Solid State II (3) *Prereq: PHZ 6426.* Physics of collective phenomena in condensed matter systems: electron-electron and electron-phonon interactions, magnetism, superconductivity, and quantum transport.

PHZ 7428: Modern Condensed Matter Physics(3) *Prereq: PHZ 6426.* Green's functions and many-body perturbation theory, with applications to topics in modern condensed matter physics. Superconductors, quantum magnetism, quantum transport, quantum hall effect. Other modern techniques and numerical methods.

PHZ 7429: Phases of Condensed Matter (3) *Prereq: PHZ 6426 or consent of instructor.* Focus on structural properties, transitions and

properties of topological defects in crystalline solids, liquid crystals, incommensurate crystals, quasicrystals, magnetically ordered systems, and random fractals.

PHZ 7608: Special and General Relativity II (3) *Prereq: PHZ 6607.* Relativistic stars, black holes, gravitational radiation; advanced topics in general relativity and cosmology.

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Physiology and Functional Genomics

College of Medicine

Graduate Faculty

Chair and Graduate Coordinator: C. E. Wood. *Complete faculty listing by department*: Follow this link

The Graduate Faculty of the Department of Physiology and Functional Genomics participates in the interdisciplinary program (IDP) in medical sciences, leading to the Doctor of Philosophy degree, with specialization in one of the six advanced concentration areas of the IDP (see *Medical Sciences)*. Departmental areas of research associated with the IDP include topical problems in various aspects of human physiology. In addition to courses associated with the IDP, the Department of Physiology and Functional Genomics offers the courses listed below.

GMS 6008: Fundamentals of Physiology and Functional Genomics (2) *Prereq: GMS 6001 or consent of instructor. Designed for first-year graduate students.* Fundamental physiological concepts. Emphasizes the impact of functional genomics technology on contemporary physiology.
GMS 6400C: Principles of Physiology (6) *Prereq: consent of instructor.* Physiology of mammalian organ systems, with special reference to the human.
GMS 6403: Advanced Endocrinology (4) *Prereq: GMS 6400C, PHA 3500, 3501 or equivalent, consent of instructor.* Readings discussions, and lectures on recent advances in endocrinology.
GMS 6405: Fundamentals of Endocrine Physiology (1) *Prereq: GMS 6001 or consent of instructor. For 1st- and 2nd-year graduate students.* Human body endocrine system physiology.

GMS 6406: Fundamentals of Pulmonary/Respiratory Physiology (1) *Prereq: GMS 6001 or consent of instructor.* Human body pulmonary/respiratory system physiology.
GMS 6408: Fundamentals of Renal Physiology (1) *Prereq: GMS 6001 or consent of instructor.* Human body gastrointestinal system physiology.
GMS 6410: Physiology of the Circulation of Blood (2) Physiology of the component parts of the circulation. The relation of structure and function. Emphasizes control mechanisms.
GMS 6411: Fundamentals of Cardiovascular Physiology (1) *Prereq: GMS 6001 or consent of instructor.* Human body cardiovascular system physiology.
GMS 6412: Human Physiology for Biomedical Engineering(4) *Prereq: consent of instructor. For students in biomedical engineering.* Fundamentals of human physiology, processes, and regulatory mechanisms of major organ systems.
GMS 6413: Current Opinion in Hypertension(1) *Prereq: GMS 6008 or consent of instructor.* Recent advances in etiology and treatment of hypertension. Authoritative updates of current directions in research; advances in major animal models of hypertension; current status and future directions in gene therapy for hypertension.
GMS 6414: Advanced Renal Physiology (2) *Prereq: GMS 6001 or consent of instructor.* Advanced knowledge of renal physiology and pathophysiology. S/U.
GMS 6415: Fundamentals of Gastrointestinal Physiology (1) *Prereq: GMS 6001 or consent of instructor.* Gastrointestinal system of human body.
GMS 6416: Human Endocrinology and Anatomy of Reproduction (2) *Prereq: master's degree.* Overview in relation to in vitro fertilization.
GMS 6490C: Research Methods in Physiology (2-4; max: 6) Special needs of each student are met by conferences and laboratory work, S/U.
GMS 6491: Journal Club in Physiology(1; max: 12) Timely research papers in all areas of physiology; namely, cellular physiology, molecular physiology, and functional genomics. S/U.
GMS 6495: Seminar in Physiology (1) S/U
GMS 6496: Recent Advances in Physiology (1) *Prereq: consent of instructor.* Content varies from year to year.
GMS 6497: Seminar on Vision (2) Current research and theory on visual function. Literature survey and design of an experiment relevant to recent theory.
GMS 6621: Vision (3) *Prereq: consent of instructor.* Introduction to methodology, anatomy, and function of vision.

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Plant Molecular and Cellular Biology

Colleges of Agricultural and Life Sciences, Liberal Arts and Sciences, and Medicine

Graduate Faculty

Director: G.F. Peter. *Graduate Coordinator:* M.A. Settles. *Complete faculty listing by department*: Follow this link

The interdepartmental, multidisciplinary program in plant molecular and cellular biology (PMCB) offers the Master of Science and Doctor of Philosophy degrees with specialization in plant molecular genetics, biochemistry, molecular biology, cell and developmental biology, pathology, and physiology. Graduate Faculty participating in this program are drawn from nine academic units: Agronomy, Botany, Environmental Horticulture, Forest Resources and Conservation, Horticultural Sciences, Microbiology and Cell Science, Molecular Genetics and Microbiology, Plant Pathology, and Soil and Water Science, in three colleges.

The PMCB program is designed to prepare students for successful research and teaching careers in academia and commercial biotechnology settings. New students are exposed to a variety of faculty and experimental systems while they rotate through several laboratories during their first two semesters before selecting an adviser and dissertation research area. Students take five required courses, biochemistry (BCH 6740 or BOT 6905), cell and developmental biology (PCB 6280), genetics (PCB 5065), metabolism (BOT 6516), and molecular biology and genomics (PCB 5530), as well as journal colloquium associated with their research interests. Additional elective courses are taken after approval by the student's supervisory committee. For additional information see

http://pmcb.ifas.ufl.edu/default.htm.

Applicants should have a strong undergraduate background in biological sciences, biochemistry, calculus, chemistry through organic, physics, and genetics; however, deficiencies may be made up during the first year of graduate study.

Master of Science and Doctor of Philosophy degree requirements are given in the General Information section of this catalog.

PCB 5065: Advanced Genetics(4) *Prereq: AGR 3303 or PCB 3063 and BCH 4024 or 5045. For graduate students in any life science discipline.* Examines genetic principles including gene and gene function; recombination and linkage; molecular markers, multipoint linkage analysis, and positional cloning; and quantitative, population, developmental, and non-Medalian genetics. Offered in fall term.

PCB 5530: Plant Molecular and Cellular Biology (3) *Prereq: undergraduate molecular biology or biochemistry.* Integrated overview of the fundamental mechanisms enabling plant growth, development, and function, and approaches to study these at molecular level. Topics include replication, repair, transcription, translation, cell cycle, transformation, gene tagging, structural genomics, proteomics, and metabolomics. Offered in fall term.

PCB 6528: Plant Molecular Biology (3) *Prereq: BCH 6415 and PCB 5065 or equivalents.* Cellular and developmental biology of plants. Lecture format with frequent discussion of recent papers. Topics include signal transduction, organelles, protein trafficking, and developmental mechanisms. Offered in spring term.

PCB 6910: Supervised Research (1-5; max: 5) S/U.

PCB 6937: Special Topics in Plant Molecular and Cellular Biology (1-4; max: 8) *Prereq: graduate course work in genetics, biochemistry, or molecular biology areas.* Contemporary research.

PCB 6971: Research for Master's Thesis (1-6) S/U.

PCB 7922: Journal Colloquy in Plant Molecular and Cellular Biology (1; max: 8) *Prereq: Required for PCMB majors.* Critical discussion and presentation of recent journal articles in the area of plant molecular and cellular biology.

PCB 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

PCB 7980: Research for Doctoral Dissertation (1-15) S/U.

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Plant Pathology

College of Agricultural and Life Sciences

Graduate Faculty

Chair: J. Jones. *Graduate Coordinators:* J. A. Rollins. *Complete faculty listing by department*: Follow this link

The Department of Plant Pathology offers graduate studies leading to the Master of Science (thesis and nonthesis option) and Doctor of Philosophy degrees. The Department also participates in the Doctor of Plant Medicine interdisciplinary professional degree.

A student may pursue studies in one of several basic areas of plant pathology. These areas include fungal plant pathology, plant bacteriology, plant virology, diagnostics, control, and also molecular and biochemical aspects of host-pathogen systems, biological control of pathogens and weeds, epidemiology, etiology, genetics of host-pathogen systems, soil microbiology, and pathogen taxonomy. In Florida, the variety of cultivated plants, coupled with an environment ideal for plant disease development, offers the student opportunities to study diseases of many crops as they develop. First-hand knowledge can be gained of diseases of field, fruit, ornamental, pasture, range, turf, and vegetable crops in temperate, subtropical, and tropical environments. Students who anticipate study in plant pathology at the University of Florida should include in their undergraduate programs training in botany, chemistry (through biochemistry), genetics, and microbiology.

The Department offers a combined bachelor's/master's degree program. Contact the graduate coordinator for information.

Courses in nematology are offered by the Department of Entomology and Nematology.

PLP 5005C: General Plant Pathology (4) *Prereq: course in biology or botany.* Microorganisms and environmental factors that cause disease in plants. Symptoms and losses caused by plant diseases. Principles of plant disease development, diagnosis, and control. Genetics and epidemiology of plant diseases. Offered fall semester.

PLP 5102: Theory and Practice of Plant Disease Control (3) *Prereq: PLP 3002C/5005C or equivalent.* Plant disease control: concepts, strategies, methods, restrictions, health and environmental concerns, future. Offered spring semester in odd-numbered years.

PLP 5115C: Citrus Pathology (3) *Prereq: PLP 3002C/5005C.* Symptoms, disease cycles, and control measures for major citrus diseases; emphasis on diagnosis using biological, chemical, and biochemical techniques. Offered at CREC, Lake Alfred, fall semester in even-numbered years.

PLP 5155: Microbiological Control of Plant Diseases and Weeds (3) *Prereq or coreq: course in plant pathology.* Principles and practice. Genetics of biological control. Commercial, environmental, and regulatory aspects of biological control. Offered fall semester in even-numbered years.

PLP 5656C: Mycology (5) *Prereq: BOT 2011C, 3303C, or PLP 3002C/5005C.* Morphology, development, and taxonomy of fungi with field and laboratory exercises emphasizing the ecology and economic importance. Offered fall semester in even-numbered years.

PLP 6223C: Plant Virology (4) *Prereq: PLP 3002C/5005C, BCH 5045, and a course in plant pathology, which may be taken as a corequisite.* Principles of plant virology; symptomatology, transmission, insect vector relationships, properties of viruses, purification, electron microscopy, morphology, serology, and control of viral diseases. Offered fall semester in odd-numbered years.

PLP 6241C: Bacterial Plant Pathogens (3) *Prereq: PLP 3002C/5005C, MCB 3020.* Relationships of bacterial plant pathogens and interactions with their hosts. Offered spring semester in even-numbered years.

PLP 6262C: Fungal Plant Pathogens (4) *Prereq: PLP 3002C/5005C or 5656C.* History, ecology, genetics, physiology, taxonomy, and management of plant pathogenic fungi. Offered spring semester.

PLP 6291: Plant Disease Diagnosis (3) *Prereq: PLP 3002C/5005C, 6262C.* Methods used in diagnosing plant diseases caused by fungi, bacteria, viruses, and abiotic conditions. Offered fall semester.

PLP 6303: Host-Parasite Interactions II (3) *Prereq: PLP 6502.* Genetic and molecular interactions of hosts and parasites with emphasis on plant disease resistance. Offered spring semester of even-numbered years.

PLP 6404: Epidemiology of Plant Disease (4) *Prereq: PLP 3002C/5005C.* Principles of ecology of plant diseases with emphasis on the effects of the climatic environment on the development of disease in populations of plants and the implications with regard to the strategy of disease control. Offered spring semester in odd-numbered years.
PLP 6502: Host-Parasite Interactions I(3) *Prereq: PLP 3002C/5005C and one course each in biochemistry and genetics.* Genetics and molecular biology of host-parasite interactions with emphasis on mechanisms of pathogenesis. Offered fall semester in odd-numbered years.
PLP 6905: Problems in Plant Pathology (1-4; max: 6) Study of any field of plant pathology including diseases of all major crop groups.
PLP 6910: Supervised Research (1-5; max: 5) S/U.
PLP 6921: Colloquium in Principles of Plant Pathology (1; max: 4)
PLP 6932: Seminar in Plant Pathology (1; max: 4) Discussion of the literature, techniques, and research pertaining to plant pathology. S/U.
PLP 6940: Supervised Teaching (1-5; max: 5) S/U.
PLP 6942: Professional Internship in Plant Disease Clinic(3) *Prereq: PLP 6262C and 6291.* Practical training, under supervision of faculty member, in diagnosing plant diseases and formulating recommendations for their management or control. S/U.
PLP 6971: Research for Master's Thesis (1-15) S/U.
PLP 7945: Plant Pathology Extension Internship(3) S/U.
PLP 7946: Plant Pathology Internship(1-10; max: 10) Off-campus internship. S/U.
PLP 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
PLP 7980: Research for Doctoral Dissertation (1-15) S/U.

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Political Science

College of Liberal Arts and Sciences

Graduate Faculty

Chair: S. C. Craig. *Graduate Coordinator:* B. J. Moraski.
Complete faculty listing by department: Follow this link

The Department of Political Science currently offers two graduate degrees: Master of Arts (thesis or nonthesis option) and Doctor of Philosophy. The political science--international relations program currently offers the Master of Arts (thesis or nonthesis option). Requirements for these degrees are given in the General Information section of this catalog.

Admission to graduate study in the Department of Political Science normally requires the completion of an undergraduate major in political science or its equivalent. Students without this preparation may be required to make up deficiencies early in their graduate work. The core sequence begins in the fall term, providing basic knowledge that students need in later semesters. In evaluating candidates for admission, the Department considers

--Prior academic achievement

--GRE scores

--Letters of recommendation from three faculty members or others familiar with the academic potential or work habits of the applicant

--A statement of purpose that conveys intellectual ambitions, indicates how the program of study satisfies the student's interests

and goals, and tells how the student would contribute to the program.

Fields of specialization offered by the Department include American government and politics, comparative politics, international relations, public policy, political theory, political behavior, and political methodology.

Master of Arts: The M.A. curricula are designed to serve students who want to pursue goals of an advanced general education, to gain skills and knowledge suitable for various types of public or private employment, or to prepare for further work at the doctoral level. M.A. students are required to complete POS 6736 Conduct of Inquiry and STA 6126 Statistical Methods in Social Research I. Students may complete their M.A. degrees with or without writing a thesis. Students pursuing the thesis option must complete 30 hours of graduate course work. The thesis is expected to be of length and quality comparable to papers presented at professional academic conferences or published in academic journals. Students pursuing the nonthesis option must complete 36 semester hours of graduate course work and defend two qualifying papers. For both M.A. options, course work in political science, exclusive of core courses, must include a minimum of two graduate-level courses in one field of political science.

The M.A. degree may be taken in conjunction with the following certificate programs:

--Political campaigning
--Public affairs
Students in these certificate programs pursue the nonthesis option.

Public affairs: This program trains students for leadership positions in state, local, and national governments as well as for careers in nonprofit organizations by providing students with knowledge and skills in the areas of organization behavior, public budgeting and finances, public management, policy analysis, program evaluation, and computer applications. The curriculum consists of seminars in political science, public administration, public policy, process, state and local politics, and research methods. Supervised internships in selected agencies in Florida are arranged by the Department of Political Science as an integral part of the training program. This specialization requires 39 hours of course work plus satisfactory completion of a 3-hour internship at the discretion of the Department. Students must also defend a final management-policy paper that incorporates analytical and substantive expertise. Graduates of the program serve in a variety of professional positions, including city managers, heads of municipal departments, directors of nonprofit organizations, analysts for the state legislature, and budget analysts for the federal government. In addition to the M.A. degree in political science, students receive the

Certificate in Public Affairs.

Political campaigning: The program is designed to provide students with the basic political skills, insights, and experience that are critical for success in the rapidly changing profession of politics and political consulting. The program combines an awareness of the academic literature on mass and elite behavior with exposure to the increasingly sophisticated techniques used by campaigns. Students take a total of 39 hours from four major areas:

--Courses required of all M.A. students

--Courses oriented to practical aspects of political campaigning and governmental affairs (lobbying), including a 3-credit campaign-related internship

--Courses placing campaigns and elections in the broader context of American politics

--Related courses offered by the College of Journalism and Communications

Entry-level jobs have included such positions as legislative aide, campaign (or deputy campaign) manager, polling analyst, state party political coordinator, general campaign consultant, and media relations. With additional experience, some former students have gone on to become state legislator (and later, member of the U.S. House of Representatives), deputy chief of staff to the governor of Florida, partner in a major Washington area polling firm, assistant to the Minister of Justice and Attorney General of Canada, and head lobbyist for a nationwide restaurant chain. In addition to the M.A. degree in political science, students receive the Certificate in Political Campaigning.

Political science--international relations: The M.A. degree in political science-- international relations is designed to provide professional education to those whose primary interest is a career in foreign relations. In this program, students must complete course work in the core of international relations theory and in two or more of the four major subfields of international relations, international political economy, international security, foreign policy, and international organization. The M.A. is a 36-hour degree, requiring successful completion of a 6-credit political science core sequence, 15 credits of departmental or extra-department electives, and a 15-credit international relations major. Students may pursue either a thesis option or take a comprehensive examination at the end of the program.

Law/Public Affairs joint degree program: This program culminates in the Master of Arts in political science and Juris Doctor degrees. A joint degree program culminating in the Master of Arts in

political science international relations and Juris Doctor degrees is also available. The joint program enables students to earn both the J.D. and the M.A. in less time than would be required to earn both degrees consecutively. Full-time students who make satisfactory progress can usually earn both degrees in 4 years. Candidates for the joint degree program must meet the entrance requirements for, and be admitted to, both the College of Law and the Department of Political Science. These requirements include both the LSAT and the GRE. Students are encouraged to announce their intent of seeking a joint degree as soon as possible. The Department of Political Science will allow 12 hours of appropriate law school courses to be credited toward the M.A. degree. The 12 credits selected from the law curriculum must be approved by the Political Science graduate coordinator on the recommendation of the student's supervisory committee. The College of Law will permit 12 hours of credit earned in political science graduate courses to be credited toward the J.D. degree. Students in the joint degree program are permitted, but not required, to pursue a companion certificate program in public affairs, political campaigning, or international development policy and administration.

Combined bachelor's/master's degree program: This combined program is designed for superior students who have the ability to pursue an accelerated program leading to the Bachelor of Arts and the Master of Arts degrees in political science or political science international relations.

Up to 12 semester hours of approved graduate-level political science courses may be used as credit for both the undergraduate and graduate degree. Applicants to the program must present

--Acceptable scores on the verbal, quantitative, and analytical writing portions of the GRE

--Completion of at least 24 semester hours at the University of Florida (including at least 12 semester hours of political science) with a GPA of 3.7 or higher

--Letters of recommendation from two faculty members in the Department of Political Science

The combined program is not recommended for students considering a Ph.D. program in political science at UF but is appropriate for those considering one of the M.A. degree plus certificate programs described above. Further information concerning this program is available from the departmental undergraduate and graduate coordinators.

Doctor of Philosophy: The Ph.D. program emphasizes preparation for academic careers through seminars, independent work with faculty, and professional development experiences including

graduate paper readings, placement workshops, and a distinguished lecture series. The Ph.D. prepares students for teaching and research in either an academic or governmental environment and opens doors to other career opportunities in both the private and public sectors. The Ph.D. program emphasizes the development of strong analytic skills and sophisticated research methods. As resources permit, the Department provides students with funding for travel expenses to scholarly meetings and professional (methodological) training support. As part of the preparation for careers in academia, doctoral students are also generally expected to contribute to the teaching mission of the Department. All Ph.D. students must complete the following:

--POS 6736P: Conduct of Inquiry
--POS 6716: Scope and Epistemologies
--POS 6737: Data Analysis
--POS 6502: Politics and Theory
--Course work in a major and two minor fields of study
--Qualifying examinations in a major field and one minor field
--A dissertation

Fields of study open to Ph.D. students include comparative politics, American politics, public policy, international relations, political behavior, political theory, and political methodology. Applications are particularly welcome from students whose intellectual interests traverse these fields, including those with interests in religion and politics, state political institutions and policy, environmental politics, international development, and minority and ethnic politics. University of Florida Ph.D. students benefit from associations with faculty in numerous other departments and centers. The Centers for Latin American Studies, African Studies, and European Studies, and the Asian Studies Program complement department faculty strengths in comparative politics and international relations. Students in the public policy concentration benefit from substantive expertise of faculty in the Institute for Child Health Policy, the Shimberg Center for Affordable Housing, and the Center for Gerontological Studies. Several faculty in the College of Journalism and Communications have interests in media and politics. For more information on these graduate programs, visit http://www.clas.ufl.edu/polisci/.

CPO 5935: Advanced Topics in Comparative Politics (3; max: 6) *Prereq: departmental approval.*
CPO 6046: Politics in Advanced Industrial Societies (3) Comparative analysis of typical political, economic, and social problems confronting governments of advanced industrial states.
CPO 6059: Democracy and Its Competitors (3) Analysis of democracy's components and several forms of authoritarianism such as apartheid, racism, fascism, right-wing populism, and totalitarianism.
CPO 6077: Social Movements in Comparative Perspective (3)

Examines major classical and contemporary theoretical approaches to the field of collective action and social movements.

CPO 6091: Introduction to Comparative Political Analysis (3) Introduction to major theoretical and methodological approach to study of comparative politics.

CPO 6206: Seminar in African Politics (3) Study of African politics in comparative perspective.

CPO 6307: Latin American Politics I (3) *Prereq: knowledge of Spanish or Portuguese; French may be substituted with consent of instructor.*

CPO 6732: Democratization and Regime Transition (3) *Prereq: CPO 6091.* Review of structural, institutional, and cultural dimensions of democratization, with special attention to Latin America, Africa, and Eastern Europe.

CPO 6736: Post-Communist Politics (3) Analysis of problems associated with democratic transition and market reform in the post-communist countries of Eastern Europe and the former Soviet Union.

CPO 6786: Peasant Politics and Society (3) Analysis of social organization and politics of the rural poor in Latin America, Africa, Asia, and pre-industrial Europe.

CPO 6795: Environmental Politics (3) Explores a variety of social-scientific approaches to the question of how politics (including ideologies, institutions, interests, and power relationships) shape humans' relationship with the natural environment.

CPO 6796: Water Politics (3) Interdisciplinary exploration of the political dimensions of human manipulation of water, wetlands and watersheds. Topics include large-scale hydrodevelopment, common-pool resources, community-based water management, marketization, and transboundary waters. Also provides a general introduction to social-scientific theorizing on human-environment relations.

INR 5935: Advanced Topics in International Relations (3; max: 6) *Prereq: departmental approval.*

INR 6036: Globalization, Regionalism, and Governance(3) Analysis of interplay between globalization and regionalism, and effects on governance.

INR 6039: International Political Economy (3)

INR 6213: Seminar: Politics of the European Union (3) Predominant political and economic theories that explain and prescribe regional economic cooperation. Sub-theories and models of decision making in European Union. Processes of EU policy making including agenda setting, policy formulation, and implementation. EU legislation in selected policy areas. Salient issues facing EU policy makers.

INR 6249: Inter-American Relations (3) *Prereq: consent of instructor.* The main purpose of this course is to provide analytical tools to understanding the historical evolution and current state of Inter-American institutions and relations. The content tries to balance theoretical analysis of some selected issues with empirical studies on recent developments in Inter-American relations.

Therefore, the weekly readings and discussions address selected topics (such as free trade, regional integration, democracy promotion, international migration, drug traffic, transnational crime, etc.) in the light of major theories in International Relations.

INR 6305: Politics of American Foreign Policy Making (3) Interaction between foreign policy and domestic political variables.

INR 6337: Survey of International Security (3) Principal problems and issues in the area of international security, considered by examining samples of scholarly literature in the subfield.

INR 6352: International Environmental Relations (3) Introduction to theories, processes and results of cooperation among states to deal with environmental issues that cross borders. Designing and implementating international environmental institutions and negotiating treaties that create institutions.

INR 6507: International Organization (3) *Prereq: INR 6607.* Advanced reading and research. Special focus on international norms, regimes, formal intergovernmental and supranational organizations, and global constitutions.

INR 6607: International Relations Theory (3) Basic forces, problems, and developments in international politics and organization.

INR 6936: Seminar in Transnational and Global Studies (1) Seminar on current issues in transnational and global studies.

PAD 5935: Advanced Topics in Public Administration(3; max: 6) *Prereq: prior departmental approval.*

PAD 6108: Public Administration Theory (3) Public administration, with emphasis on the units of analysis and contributions of each approach to general understanding of the field.

PAD 6227: Public Budgeting and Finance (3) Decision making; budget planning and formulation.

PAD 6434: Leadership and Ethics in Public Agencies (3)

PAD 6865: Development Administration (3) *Prereq: consent of instructor.* Public administration practices in developing societies.

PAD 6946: Internship in Government (3) *Prereq: departmental approval.* S/U.

POS 5935: Advanced Topics in Political Science (3; max: 6) *Prereq: departmental approval.*

POS 6xxx: Politics of Campaign Finance(3) History, theories, and practice of campaign finance in American politics.

POS 6045: Seminar in American Politics (3) Introduction to major conceptual approaches to the American political system and to the history of the study of American politics.

POS 6048: American Political Development(3) Development from founding to the present.

POS 6127: State Government and Politics (3) The bibliography, methodology, and research topics of American state and local governments.

POS 6146: Urban Politics (3) Explores processes, actors, and institutions in local U.S. politics. Briefly examines significant issue areas including fiscal crisis, racial conflict, and education.

POS 6157: Community Analysis(3) Development of social, economic, and political profiles in understanding trends, projections, and public policy alternatives.
POS 6207: Political Behavior (3) Examines participation, political culture, and public opinion including classic and current research.
POS 6208: Empirical Political Research (3) *Prereq: POS 6207.* Criticism/evaluation of research, hypothesis formulation, concept development, measurement, secondary data analysis, and microcomputer statistical analysis. Original empirical research paper on some aspect of political behavior.
POS 6247: Seminar in Political Socialization and Political Cognition (3) Review of literature on political socialization, social influence, personality, and political cognition.
POS 6272: Political Participation (3) Social, political, and institutional factors that affect patterns of electoral and non-electoral political participation in the U.S. and other societies.
POS 6274: Political Campaigning (3) Overview of tasks and challenges, including strategy, uses of campaign polls, organization, management, communication, and mobilization.
POS 6278: Advanced Campaign Strategy (3) *Prereq: POS 6274.* Strategy implications of media production on campaigns, party management, direct mail, polling, and fundraising.
POS 6279: The Politics of Direct Democracy (3) Theory and practice of direct democracy in American states, including processes of initiative, referendum, and recall.
POS 6292: Religion and Politics (3) Interplay between religion and politics from the perspective of relevant social science approaches.
POS 6427: Legislative Process (3) Examines the role of legislative institutions in American government.
POS 6453: Political Parties and Interest Groups (3) Examines the structure and functions of political parties and interest groups in the United States.
POS 6458: The Politics of Campaign Finance (3) History, theories, and practices of campaign finance in American politics.
POS 6707: Qualitative Research Methods for Political Science(3) Survey of methods focusing on concept formation, case selection, and data collection suitable for research designs based on small number of case studies.
POS 6712: Empirical Theories of Politics (4) Developing theory as part of empirical inquiry, particularly as related to dissertations. Attributes that make a theory compelling and useful. Major traditions of empirical theory in political and social sciences. Assistance in creating theory.
POS 6716: Scope and Epistemologies of Political Science (3) Overview of development of political science as discipline and pluralistic introduction to epistemological perspectives that characterize field.
POS 6736: The Conduct of Inquiry (3) Empirical research methodology in political science.
POS 6737: Political Data Analysis (3) Introduction to quantitative

methods and techniques.
POS 6747: Topics in Political Research Methodology (3) Review of recent applications of advanced research methods to different types of political science data.
POS 6757: Survey Research (3) Methods of survey research in context of field investigation: formulating research hypotheses, constructing measurement instruments, and collecting and analyzing data.
POS 6909: Individual Work (1-4; max: 12)
POS 6910: Supervised Research (1-5; max: 5) S/U.
POS 6933: Special Topics (1-3; max: 6)
POS 6940: Supervised Teaching (1-5; max: 5) S/U.
POS 6971: Research for Master's Thesis (1-15) S/U.
POS 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
POS 7980: Research for Doctoral Dissertation (1-15) S/U.
POT 5935: Advanced Topics in Political Theory (3; max: 6) *Prereq: departmental approval.*
POT 6016: Ancient Political Thought(3) Intensive exploration of Classical Greek and Roman thinkers and texts.
POT 6056: Modern Political Thought (3) Close reading of political theorists and themes from the Renaissance through the 19th century. Emphasizes thinkers regarded as central to the development of republicanism, absolutism, liberalism, democracy, conservatism, and feminism.
POT 6067: Contemporary Political Theory (3) Close reading of one or more twentieth-century contemporary political philosophers whose works have made major impacts on field (e.g. Arendt, Foucault, Habermas).
POT 6314: Democratic Theory (3) Brief look at some classical theorists and critics of democracy (Plato, Rousseau, Tocqueville, Marx). Focus on contemporary debates in democratic theory. Participation, deliberation, representation, and multiculturalism.
POT 6416: The Marxist Tradition and its Critics (3) Examines the seminal works of Karl Marx and a selection of influential contemporary texts challenging and transforming the Marxist tradition.
POT 6505: Politics and Theory (3) Investigation of the nature of political theory and normative issues in politics.
POT 6516: Political Judgment(3) Investigation of the nature of political judgment from historical, conceptual, and empirical perspectives in western thought.
POT 6xxxB: Liberalism and Its Critics (3) Close reading of selected texts by leading defenders of liberalism and influential theoretical standpoints questioning liberal orthodoxy. Communitarianism, multiculturalism, Marxism, democratic theory, feminism, and critical race theory.
PUP 5935: Advanced Topics in Public Policy(3; max: 6) *Prereq:*

departmental approval.

PUP 6006: Policy Evaluation (3) Examines methodologies appropriate for analyzing public policies.

PUP 6007: Policy Process (3) General examination of public policy formulation and implementation. Special emphasis upon political and economic determinants and relationship to social theory.

PUP 6009: Public Policy Analysis (3) Analytic approach to understanding economic and political tools used to formulate solutions to public problems such as environmental quality, business regulation, public education, health care, and welfare.

PUP 6015: Comparative Policy Analysis (3) Approaches to analyzing policy, with a comparative perspective.

PUP 6315: Race, Gender, and Politics (3) Politics and cultural discrimination, political power, political behavior, and public policy.

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Psychology

College of Liberal Arts and Sciences

Graduate Faculty

Chair: N. E. Rowland. *Graduate Coordinator:* R. L. West. *Complete faculty listing by department*: Follow this link

The Department of Psychology offers the Master of Science and the Doctor of Philosophy degrees. Complete descriptions of the minimum requirements for these degrees are provided in the *General Information* section of this catalog. Students are not accepted for a terminal master's degree.

Doctoral areas of specialization include the teaching and research areas of cognition and sensory processes, comparative, developmental, behavior analysis, behavioral neuroscience, social psychology, and counseling psychology. The training program in counseling psychology is accredited by the American Psychological Association. A predoctoral internship of one year is required for the counseling psychology program.

Undergraduate preparation should include at least one course in experimental methods and one course in statistics. Other courses in psychology should include at least three or four of the following: cognition, developmental, learning, personality, physiological, sensory, and social. Applicants with GRE scores lower than 1200 are usually not admitted to graduate study in psychology.

Co-major: The Department offers two co-major programs in conjunction with the Department of Educational Psychology leading to the Doctor of Philosophy degree in psychology and either

educational psychology or research and evaluation methodology.

CBH 6056: Comparative Psychology (3; max: 9) *Prereq: consent of instructor.* Survey of literature.
CLP 6169: Seminar: Psychology and Deviant Behavior (3; max: 6) Analysis of specific deviant behaviors, with emphasis on theory and research related to diagnosis and clinical management.
DEP 6057: Advanced Developmental Psychology I (3) Surveys research literature on developmental changes during infancy and cognitive development during childhood.
DEP 6058: Advanced Developmental Psychology II (3) Theories and current literature in social development, focusing on the period of infancy through adolescence.
DEP 6059: Seminar: Special Topics in Developmental Psychology (1-3; max: 12) Examination of theory and research in selected topic.
DEP 6099: Survey of Developmental Psychology (2-3; max: 3) *Prereq: graduate status.* Empirical, theoretical, and methodological foundations of developmental psychology.
DEP 6406: Advanced Adulthood and Aging(3) Overview of major theories and research in psychology in relation to aging.
DEP 6409: Seminar: Adult Development and Aging (3; max: 9) Topics in the psychology of aging, with emphasis on theory, research, and methodology.
DEP 6799: Current Research Methods in Developmental Psychology (3) Methods for study of development, including experimental and observational techniques.
DEP 6936: Current Research in Developmental Psychology (1-2; max: 20)
DEP 7608: Theories of Developmental Psychology (3) Theoretical perspectives and major theorists in child and developmental psychology.
EAB 5436: Behavioral Pharmacology (3) *Prereq: EAB 3002, STA 3023.* Experimental analysis of the mechanisms based on interactions of drugs with environmental variables controlling behavior.
EAB 6099: Survey of Behavior Analysis (2-3; max: 3) *Prereq: admission to graduate status or consent of instructor.* Survey of basic learning and motivational processes including operant and classical conditioning. Introduction to individual-subject research methods and to applied behavior analysis.
EAB 6118: Theoretical Foundations of Behavior Analysis (3) *Prereq: consent of instructor.* Examination of current theoretical issues in behavior analysis, with emphasis upon systematic integration of behavior principles into general behavior theory.
EAB 6707: Applied Behavior I (3) Research methods. Measurement, reliability, experimental design, extension of basic research to applied settings.
EAB 6716: Behavior Analysis in Developmental Disabilities (3) *Prereq: EAB 3764 and consent of instructor.* Behavioral approaches to study and treatment of mental retardation and developmental

disabilities. Acquisition techniques, assessment, and treatment of behavior disorders, program evaluation, and management.

EAB 6719: Seminar: Strategies and Tactics of Human Behavioral Research (3) *Prereq: EAB 6707.* Advanced study of a scientific approach to investigating human behavior in applied settings.

EAB 6750: Quantitative Methods(3) Introduction to quantitative methods in single-case research.

EAB 6780: Ethics and Professional Issues (1-3; max: 3) Examines ethical decision making and regulatory standards in applied behavior analysis, ethics in research and publication, and professional issues arising in various settings.

EAB 6937C: Seminar: Special Topics in Experimental Analysis of Behavior (1-4; max: 9) *Prereq: EAB 6099.* Current research, theory, and instructional techniques.

EAB 6939: Seminar: Special Topics in Applied Behavior Analysis (1-3; max: 9) Current research, technological developments, and professional issues.

EAB 7089: Advanced Seminar: Experimental Analysis of Behavior (3; max: 9) *Prereq: consent of instructor.* Restricted areas of experimental analysis of behavior such as schedules of reinforcement, stimulus control, current issues in research methods, and complex repertoires.

EAB 7090: Verbal Behavior (3) *Prereq: EAB 6118.* Current empirical and theoretical issues relevant to functional analysis of verbal behavior.

EXP 6099: Survey of Cognition and Sensory Processes (2-3; max: 3) *Prereq: graduate status.* Empirical and theoretical foundations.

EXP 6609: Seminar: Cognition (3; max: 9) *Prereq: EXP 3604 or consent of instructor.* Selected topics in the areas of thinking, problem solving, and reasoning.

EXP 6939: Seminar: Current Issues in Cognition and Sensory Processes (3; max: 9) *Prereq: consent of instructor.*

GEY 7408: Psychotherapy with Older Adults(3) *Prereq: admission to graduate study in counseling psychology or clinical and health psychology or consent of instructor; PCO 7944 for counseling psychology or CLP 6407 for clinical and health psychology.* Psychotherapeutic interventions with older adults.

MHS 6430: Introduction to Family Counseling (3) *Prereq: MHS 6401, 7800.*

MHS 6440: Marriage Counseling (3)

MHS 7431: Advanced Family Counseling (4) *Prereq: MHS 6430.*

PCO 6057: Psychology of Counseling I (3) *Prereq: graduate status in the counseling psychology program.* Theory, research, and skills in therapeutic approaches to counseling psychology.

PCO 6058: Psychology of Counseling II (3) *Prereq: graduate status in counseling psychology program.* Theory, research, and skills in short-term approaches to counseling psychology.

PCO 6059: Psychology of Counseling III (3) *Prereq: PCO 6058.* Theory, research, and skills in psychodynamic approaches to

counseling psychology.

PCO 6278: Diversity and Multiculturalism in Counseling Psychology(3) Overview of development of mutlicultural counseling theory, research, and practice. Historical background, multicultural counseling competencies, cultural identity development and worldview, spiritual issues, understainding oppression (e.g., racisim, sexism, heterosexism, able-ism), case conceptualization, MCC organizaitonal development, ethical guidelines for working with diverse populations, and MCC skills development.

PCO 6316C: Psychological Assessment I (3) *Prereq: consent of instructor.* Consideration of basic assessment theory and of fundamental theories of intelligence and intellectual assessment, including practicum-type administration of intelligence tests.

PCO 6317C: Psychological Assessment II (3) *Prereq: consent of instructor.* Fundamental theories of personality and individual assessment of personality, including practicum-type administration of personality tests.

PCO 6931: History and Contemporary Issues in Counseling Psychology (3) Introduction to foundations of counseling psychology and its research. Contemporary literature of discipline.

PCO 6939: Seminar: Current Topics in Counseling Psychology (3; max: 15) *Prereq: MHS 6401 or consent of instructor.* Emphasis on theoretical background and implications for applied work.

PCO 7217: Professional Ethics and Skills in Counseling Psychology (3) *Prereq: graduate student status in counseling psychology or consent of instructor.* Professional issues, ethics, relationships, and skills pertaining to practice of counseling psychology.

PCO 7247: Group Counseling/Psychology (3) *Prereq: graduate student status and consent of instructor; coreq: enrollment in counseling practicum.* Process of group counseling and psychotherapy as well as the counselor's role in the facilitation of group process.

PCO 7537: Vocational Psychology (3) *Prereq: graduate student status and consent of instructor.* Examines major theories and research. Emphasizes vocational assessment.

PCO 7944: Practicum in Counseling Psychology (1; max: 12) *Prereq: PCO 7217.* For second-year doctoral students in counseling psychology, 12 hours per week of on-site clinical work plus individual and group supervision.

PCO 7945: Advanced Practicum in Counseling Psychology (1; max: 4) *Prereq: PCO 7217, 7947.* For advanced students in counseling psychology. On-site clinical work at approved mental health agencies: 12 to 15 hours per week of work including individual and group supervision.

PCO 7949: Internship in Counseling Psychology (1; max: 12) *Prereq: written application to the Counseling Psychology Internship Coordinator.* Full-time or equivalent work in a university or community agency where counseling functions are carried out under supervision. Open only to students in the counseling psychology program.

PPE 6059: Seminar in Personality (3; max: 9) Personality development and dynamics.
PPE 6308: Research Methods II (3) *Prereq: PPE 6307 or consent of instructor.* Theoretical, methodological, and procedural aspects of research in social-personality. Emphasis on issues encountered in the design and analysis of experiments.
PSB 5445: Drug Use and Abuse (3) *Prereq: 6 hours of psychology.* Objective, informational approach to the commonly used and abused drugs. Psychological, physiological, social, medical, legal, and historical aspects.
PSB 5935: Seminar in Physiological Psychology (1-3; max: 10) *Prereq: PSB 3004 or 3054 and STA 3023.* Selected topics in behavioral neuroscience. S/U option.
PSB 6082: Neuroethology (3) *Prereq: PSB 3004, 3054, or PSB 6087 and consent of instructor.* Focuses on cellular mechanisms underlying fundamental aspects of behavior, including the production and coordination of movement, sensory processing and sensorimotor integration. Electrophysiological studies of invertebrate and simple vertebrate behaviors.
PSB 6087: Advanced Physiological Psychology (3) Thorough review of basic concepts in physiological psychology, advanced concepts including methodology and recent progress in selected areas of neuroscience and psychobiology.
PSB 6088L: Behavioral Neurobiology (3) *Prereq: PSB 6087.* Behavioral studies involving physiological manipulations and measures, and criticism of the scientific inferences therein.
PSB 6099: Survey of Physiological and Comparative Psychology (2-3; max: 3) *Prereq: graduate status.* Empirical and theoretical foundations of physiological and comparative psychology.
PSB 7248: Neurobehavioral Relations (3) *Prereq: PSB 6087.* Theories and data on the central nervous system basis for higher order function. Emphasis will be on arousal, purposeful behavior, and learning.
PSB 7249: Seminar in Neural Mechanisms and Behavior (3) *Prereq: PSB 6087.* Recent and specialized topics in brain-behavior relations.
PSY 6608: History of Psychology (2-3; max: 3)
PSY 6905: Individual Work (1-3; max: 10) Reading or research areas in psychology.
PSY 6910: Supervised Research (1-3; max: 5) S/U.
PSY 6930: Topics in Psychology (1-3; max: 9)
PSY 6939: Seminar: The Teaching of Psychology (1-3; max: 10) *Prereq: consent of instructor.* Examination of general techniques of teaching with emphasis on interpersonal nature of teaching, course planning, textbooks, testing and evaluation, and lecturing within the framework of general introductory psychology course. Videotaped lecturers.
PSY 6940: Supervised Teaching (1-3; max: 5) S/U.
PSY 6971: Research for Master's Thesis (1-6) S/U.
PSY 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with

a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

PSY 7980: Research for Doctoral Dissertation (1-12) S/U.

SOP 6099: Survey of Social Psychology (2-3; max: 3) *Prereq: graduate status.* Empirical and theoretical foundations of social psychology.

SOP 6219C: Advanced Research Techniques in Social-Personality Psychology (3; max: 12) *Prereq: consent of instructor.*

SOP 6409: Seminar: Current Topics in Social-Personality Psychology (3; max: 12)

SOP 6419: Seminar: Attitudes and Social Cognition (3; max: 12) *Prereq: graduate status.* Seminar addressing topics such as attitude change, attribution, social perception, social cognition, etc.

SOP 6509: Seminar: Interpersonal Relations and Group Processes (3; max: 12) *Prereq: graduate status.* Seminar addressing topics such as impression management, leadership, small group behavior, conflict and accord, and race relations.

SOP 6929: Colloquium in Research in Social-Personality Psychology (1-3; max: 8) *Prereq: Graduate status in social-personality psychology.* On-going colloquium series intended for graduate students in social-personality psychology involving the presentation and discussion of research initiatives.

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Public Health

College of Public Health and Health Professions

Graduate Faculty

Director and Graduate Coordinator: M. Peoples-Sheps. *Complete faculty listing by department*: Follow this link

The College of Public Health and Health Professions offers the Master of Public Health degree program through four departments in the college: Behavioral Science and Community Health, Epidemiology and Biostatistics, Environmental and Global Health, and Health Services Research, Management, and Policy. This non-thesis program is designed to prepare students to become effective public health practitioners, scientists, and educators.

Students select one of six concentration areas:
--Biostatistics
--Environmental health
--Epidemiology
--Public health management and policy
--Public health practice
--Social and behavioral sciences

Both a 48-credit program for students without terminal health science degrees and a 42-credit program for students with terminal degrees are offered. A combined bachelor's/master of public health program is available, as well as a 15-credit college certificate program. Students interested in collaborative programs may pursue joint M.P.H. and D.V.M., M.D., J.D., or Pharm.D. degrees, or concurrent master's and Ph.D programs. The MPH degree program and the Public Health certificate are available on campus and

online. For program descriptions and information on applying, visit the website: www.mph.ufl.edu.

48-credit Master of Public Health: Students who do not hold a terminal degree in a health science discipline are eligible to apply for the 48-credit program. The program provides comprehensive coverage of core public health content and allows selection of a concentration. Students must complete 16 credits of core public health course work, 15-21 credits of concentration core courses, up to 12 credits of elective courses, and 5-8 credits of internship. The course work representing these requirements is described below.

42-credit accelerated Master of Public Health: Students who hold a terminal degree (usually a doctoral degree) in a health science discipline may be eligible for the 42-credit accelerated program. This program requires completion of 16 credits of core public health course work, 21 credits of concentration and elective course work, and a 5-credit internship.

Combined degree program: The College offers a combined degree program to allow qualified undergraduates to earn both a bachelor's degree and the Master of Public Health degree efficiently. Seniors with any undergraduate major are eligible for the combined degree program as long as they have an undergraduate GPA of at least 3.2 and competitive scores on the verbal and quantitative portions of the GRE, and their career interests match the M.P.H. program. Students accepted into the combined degree program complete 15 credits of public health course work while still undergraduates, leaving only 33 credits after admission to graduate school. Students must achieve a B or better in public health courses taken as an undergraduate and be accepted to graduate school to complete the program.

Core courses: All M.P.H. students take five public health core courses. The core courses in environmental health, epidemiology, public health management and policy, and social and behavioral sciences are taken by all students. The core biostatistics course varies across concentration areas. Students in the biostatistics, environmental health, epidemiology concentrations must take PHC 6052 Introduction to Biostatistical Methods. All other M.P.H. students must take PHC 6050 Statistical Methods for Health Science I. In addition, all students must take a 1-credit seminar in contemporary public health issues and 5 to 8 credits of PHC 6946 Public Health Internship.

Internship, major paper, and oral presentation: Each student completes an internship, which provides an opportunity to apply knowledge acquired in the classroom to a real public health problem in a practice setting. The internship is usually completed in the student's final term in the program. Students may engage in many activities during an internship, but each student must have one

special project which serves as the basis for a major paper and an oral presentation. The written and oral presentations represent the culmination of the academic experience in the M.P.H. program. Presentations, which are scheduled on Public Health Day near the end of each semester, provide each student with an opportunity to organize and present the details of the special project to faculty, students, and invited guests. Students are expected to display their understanding of their projects in the larger context of public health as a cross-disciplinary field, and in relation to the competencies expected of all M.P.H. graduates. Three faculty members, including the supervisory committee chair, attend each presentation and are responsible for assessing whether the student has successfully demonstrated a broad knowledge of the field of public health and depth in his or her concentration area.

HSA 6114: U.S. Health Care System (3) *Prereq: consent of instructor.* Overview of structural elements of the contemporary system. Historical antecedents, patients, providers, payers, and the role of health policy.

PHC 6001: Principles of Epidemiology in Public Health(3) Epidemiology methods frequently used to study disease patterns in community and clinic-based populations. Includes distribution and determinants of health-related states or events in specific populations and application to control of health problems.

PHC 6010: Data Management and Statistical Computing for Epidemiology(3) *Prereq: knowledge of statistics and personal computers.* Database design, data management, efficient data collection, and computer-based methods for statistical design and analysis.

PHC 6050: Statistical Methods for Health Sciences Research I(3) Appropriate use of data summarization and presentation of basic statistical methods, including ANOVA, nonparametric methods, inference on discrete data, inference on survival data, and regression methods for continuous, binary, and survival data. Required core course for students in public health management and policy and social and behavioral science concentrations.

PHC 6052: Introduction to Biostatistical Methods (3) Introduction to the concepts and methods of biostatistical data analysis. Topics include descriptive statistics, probability, standard probability distributions, sampling distributions, point and confidence interval estimation, hypothesis testing, power and sample size estimation, one- and two-sample parametric and non-parametric methods for analyzing continuous or discrete data, and simple linear regression. SAS statistical software for data management, statistical analysis and power calculations. Required core course for students in biostatistics, environmental health, and epidemiology concentrations.

PHC 6053: Regression Methods for the Health and Life Sciences (3) *Prereq: PHC 6052 or equivalent. For graduate students in fields other than statistics.* Introduction to a wide range of regression methods. Primary topics are multiple linear regression,

logistic regression, and Poisson regression.

PHC 6102: Introduction to Public Health Administrative Systems (3) Overview of the public health system, including public health concepts and practices, health care delivery and financing. Focus on understanding the organization and administration of health services, structure and functions of the U.S. public health system, and health insurance programs.

PHC 6406: Psychological, Behavioral, and Social Issues in Public Health (3) Health behavior from an ecological perspective; includes primary, secondary and tertiary prevention across a variety of settings; incoporates behavioral science theory and methods.

PHC 6601: Seminar in Contemporary Public Health Issues (1) Introduction to key interdisciplinary, cross-cutting topics essential to the contemporary practice of public health. Written and oral reports.

PHC 6901: Epidemiology Literature Review and Critique (Journal Club) (1; max: 3) *Prereq: PHC 6000, 6011; and PHC 6060 or equivalent.* Critically analyze published literature on research methods and measures. S/U.

PHC 6905: Independent Study(1-6; max: 6) *Prereq: consent of instructor.*

PHC 6931: Seminar in Contemporary Public Health Issues (1) Introduction to key interdisciplinary, cross-cutting topics essential to the contemporary practice of public health. Written and oral reports.

PHC 6946: Public Health Internship (1-9; max: 9) *Prereq: consent of instructor.* Fieldwork at approved site. Focus on practical application of skills in student's concentration area. S/U.

PHC 7000: Epidemiology Seminar II: Critical Evaluation, Research Proposals, and Methods (3) *Prereq: PHC 6000, 6011,and Epidemiology Seminar I.* Epidemiology and health policy research. Constructing research ideas and developing them into full proposals. Discussion of auxiliary methods based on students' planned dissertation topics.

PHC 7056: Analysis of Longitudinal Data (3) *Prereq: STA 6326, STA 6327 (or equivalent), STA 6207, STA 6208 (or equivalent), and STA 6246 (or equivalent).* Likelihood-based and semiparametric methods for longitudinal data. Methods to deal with missing data in both settings.

PHC 7066: Large Sample Theory (3) *Prereq: STA 6326 and 6327 (or equivalent).* Detailed introduction to large sample theory and its application in univariate and multivariate parametric and nonparametric estimation.

Biostatistics

Master of Public Health degree, concentration in biostatistics: The contribution of biostatisticians is far reaching and includes both core public health research and consultation with other health professionals. The biostatistics concentration is designed primarily for students with a previous graduate degree (particularly in the health sciences) who want to obtain a solid background in quantitative and analytical methods for public health research. The

course work exposes students to methodology typically used to analyze different types of public health data and gives them opportunities to apply these methodologies themselves.

Graduates of the M.P.H. program with a concentration in biostatistics return to their careers with an improved understanding of quantitative methods for public health research. This increased knowledge will facilitate their own research programs and will enhance their ability to critically read the literature in their field. The biostatistics concentration requires completion of 6 concentration core courses: PHC 6053 Regression Methods for the Health and Life Sciences, PHC 6000 Epidemiology Research Methods I, PHC 6937 SAS for Public Health Data, PHC 6937 SAS for Public Health Analysis, and PHC 6937 Biostatistical Computing Using R. Remaining courses include the public health internship (PHC 6946) and electives in statistics and public health. Visit the biostatistics concentration website for the most up-to-date information about course options: http://www.mph.ufl.edu/concentrations/biostatistics.htm. See the department of Epidemiology and Biostatistics website for information about other programs offered by the department: http://ebs.phhp.ufl.edu/.

PHC 6000: Epidemiology Methods I (3) *Prereq: PHC 6001, 6050 or PHC 6052, or departmental approval.* Overview of epidemiology methods used in research studies that address disease patterns in community- and clinic-based populations.
PHC 6053: Regression Methods for the Health and Life Sciences (3) *Prereq: PHC 6052 or equivalent. For graduate students in fields other than statistics.* Introduction to a wide range of regression methods. Primary topics are multiple linear regression, logistic regression, and Poisson regression.
PHC 6937: Special Topics in Public Health(1-6; max: 12)

Environmental Health

Master of Public Health degree, concentration in environmental health: Professionals trained in environmental health study the impact of our surroundings on our health. They understand how environmental risk factors can cause diseases like asthma, cancer, and food poisoning. Environmental health professionals make up approximately half of public health personnel and the field accounts for about half of public health expenditures. Students interested in environmental health typically have a background in biological or physical sciences, engineering, nursing, medicine, and veterinary medicine. Prior experience in chemistry, biology, statistics, and Microsoft Excel software is desirable. Please note the prerequisites for Environmental Health courses and speak with the instructor if you have not successfully completed the prerequisites. The following courses are required for all students pursuing the environmental health concentration: VME 6602, VME

6607, PHC 6702, PHC 6937 Risk Communication for Environmental Health and Risk Assessment, and either VME 6603 or VME 6606. Students may also choose two of the following courses: ENV 5105, EES 5245, FOS 5205, and SWS 5551. Environmental health students complete their programs with an internship (PHC 6946) and electives on a wide variety of environmental health and public health topics.

Visit the environmental health concentration website for the most up-to-date information about course options: http://www.mph.ufl.edu/concentrations/environmentalhealth.htm. And visit the Website of the Department of Environmental and Global Health for information about other academic programs and activities in the department: http://egh.phhp.ufl.edu/.

EES 5245: Water Quality Analysis (3) *Prereq: CHM 2046, EES 4201, or 6208, or consent of instructor.* Applying the principles of analytical chemistry to determine the chemical composition of natural waters and wastewaters. Emphasizes methods used routinely to determine water and wastewater quality and to interpret data.
ENV 5105: Foundations of Air Pollution (3) Principal types, sources, dispersion, effects, and physical, economic and legal aspects of control of atmospheric pollutants.
FOS 5205: Current Issues in Food Safety and Sanitation (3) Microbial, chemical, and biological safety of food; principles of sanitation for food processing and retail food industries.
PHC 6702: Exposure Measurement and Assessment (3) *Prereq: at least one undergraduate course in biostatistics or statistics. Coreq: access to a computer with Excel, SPSS, or SAS.* Develop skills to design exposure studies applicable to public health investigations, veterinary health investigations, and health risk assessments.
SWS 5551: Soils, Water, and Public Health (3) *Coreq: Graduate status.* Highlights important instances where soil and water science and public health overlap. Develops skills required for competency in both disciplines.
VME 6602: General Toxicology (3) *Prereq: background in biochemistry, physiology, and pharmacology.* General principles of toxicology. Mechanisms for occurrence of toxic effects in target organs and tissues.
VME 6603: Advanced Toxicology (3) *Prereq: VME 6602.* Survey of the health effects of each major class of toxicants.
VME 6605: Toxic Substances(3) *Prereq: general toxicology.* In-depth information on signs, symptoms, underlying mechanisms, diagnosis, and management of poisoning by drugs and chemicals.
VME 6607: Human Health Risk Assessment(4) Conceptual approaches and computational techniques for quantitative health risk assessment.

Epidemiology

Master of Public Health degree, concentration in epidemiology: Epidemiology focuses on the study of the distribution and determinants of health in populations and communities. It is the scientific foundation of public health research that seeks to reduce risk factors and improve health. The discipline also contributes to public health practice and policy, and research in other health-related fields such as medicine and pharmacy. This concentration area is designed to train professionals to apply the principles and methods of epidemiological investigation in a broad range of settings. The required concentration core courses in epidemiology are PHC 6000, PHC 6052, PHC 6002, PHC 6003, PHC 6011, and PHC 6053. Epidemiology concentration students complete their programs with an internship (PHC 6946) and electives in epidemiology and public health.

Additional detail and options for epidemiology elective course work is at the website: http://www.mph.ufl.edu/concentrations/epidemiology.htm. Please also visit the website of the Department of Epidemiology and Biostatistics for up-to-date information about other epidemiology programs and activities: http://ebs.phhp.ufl.edu/.

PHC 6000: Epidemiology Methods I (3) *Prereq: PHC 6001, 6050 or PHC 6052, or departmental approval.* Overview of epidemiology methods used in research studies that address disease patterns in community- and clinic-based populations.
PHC 6002: Epidemiology of Infectious Diseases (3) *Prereq: PHC 6001, and PHC 6052 or PHC 6050 or departmental approval.* Epidemiology, prevention, and control of infectious diseases affecting local, national, and global community health; epidemiologic methods used in disease surveillance and measures used in slowing or preventing spread of disease.
PHC 6003: Epidemiology of Chronic Diseases and Disability (3) *Prereq: PHC 6001, and PHC 6052 or PHC 6050 or departmental approval.* Overview of epidemiology of chronic diseases and disabilities prevalent in various populations. Introduces contemporary methods for surveillance including risk factors, etiology, and changes over time.
PHC 6011: Epidemiology Methods II (3) *Prereq: PHC 6000 and PHC 6052, or departmental approval.* Analytic methods in epidemiology with a foundation in applied epidemiological analysis and experience in peer-review productivity based on secondary data analysis.
PHC 6053: Regression Methods for the Health and Life Sciences (3) *Prereq: PHC 6052 or equivalent. For graduate students in fields other than statistics.* Introduction to a wide range of regression methods. Primary topics are multiple linear regression, logistic regression, and Poisson regression.
PHC 6162: Public Health Grant Writing (2) Problems encountered in the design and execution of public health population-

based and intervention studies.

PHC 6405: Epidemiology of Aging (3) *Prereq: PHC 6001.* Principles and methods of epidemiology applied to aging. Examines concepts such as trends in aging and the health of aging populations, explanations and consequences of mortality decline, determinants of health and survival, and how different types of health care systems are used in prevention, intervention and treatment, and supportive care.

PHC 6912: Special Project: Independent Research (1-9; max: 9) *Prereq: consent of instructor.* Student must undertake significant responsibility for all or part of a research project of particular interest. S/U.

PHC 6938: Oral and Craniofacial Epidemiology (3) *Prereq: PHC 6001 and 6050 or equivalent. PHC 6000 and STA 6166 are recommended, but not required.* Introduction to epidemiology of oral and craniofacial diseases. Principles and methods of epidemiologic research in this field.

PHC 6946: Public Health Internship (1-9; max: 9) *Prereq: consent of instructor.* Fieldwork at approved site. Focus on practical application of skills in student's concentration area. S/U.

PHC 7000: Epidemiology Seminar II: Critical Evaluation, Research Proposals, and Methods (3) *Prereq: PHC 6000, 6011,and Epidemiology Seminar I.* Epidemiology and health policy research. Constructing research ideas and developing them into full proposals. Discussion of auxiliary methods based on students' planned dissertation topics.

Public Health Management and Policy

Master of Public Health degree, concentration in public health management and policy (PHMP): This concentration focuses on the structure and administration of health organizations and the policies that impact health programs and reimbursement of health services. The concentration encompasses two of the major roles of leaders in public health. Essential skills for managing a health agency or organization include accounting, financial management, human resource management, strategic and program planning, operations research, economics, and monitoring outcome measures. Development, analysis, interpretation, and evaluation of government policies require analytical skills and social skills, as well as a deep understanding of politics.

The PHMP concentration requires six core courses: HSA 5177, HSA 6119, HSA 6152, PHC 6104, PHC 6937 Public Health law and Ethics, PHC 6937 Systems Thinking for Public Health. In addition, students take two courses in one of three areas of specialization:

--Public health management
--Public policy
--Pharmaceutical use and policy.

The PHMP students complete their programs with an internship (PHC 6946) and public health elective courses.

Visit the public health management and policy concentration website for the most up-to-date information about course options: http://www.mph.ufl.edu/concentrations/managementpolicy.htm.

The website of Department of Health Services Research, Management, and Policy provides additional information about activities and other academic programs in the department: http://hsrmp.phhp.ufl.edu/.

HSA 5174: Fundamentals of Health Care Finance (3) *Prereq: consent of instructor.* Introduction to basic theory and principles of finance as applied to the health care industry. Financial statements, cost measurement, budgeting, and capital investment decisions.
HSA 6119: Introduction to Management of Health Services Organizations (3) *Prereq: consent of instructor.* Organizational principles and practices as applied to management. Organizational theory, managerial role, managing groups, work design, and organization design.
HSA 6152: Overview of U.S. Health Policy (3) *Prereq: consent of instructor.* Survey and critical analysis of federal and state health policy processes and outcomes as they relate to the effectiveness and efficiency of health services in the U.S. and selected countries.
PHC 6104: Evidence-Based Management of Public Health Programs (3) *Prereq: PHC 6102 or equivalent.* Practical guidance on how to choose, administer, and evaluate evidence-based programs and policies in public health settings.
PHC 6937: Special Topics in Public Health(1-6; max: 12)

Public Health Practice

Master of Public Health degree, concentration in public health practice: This concentration provides the opportunity to develop breadth in public health by taking coursework in two, three, or four of the core public health concentrations. Such breadth is often required of professionals who assume positions of leadership in public health. It is available to students in joint and concurrent degree programs, medical and other health scientists, and working professionals. Public Health Practice is the only M.P.H. concentration available online.

The campus curriculum for this concentration follows the same model as the other concentrations. Students pursuing public health practice begin their programs with the 5 core courses required of all MPH students. Instead of a specified set of concentration core courses, however, these students may choose 2 or more courses from advanced course options in two to four of the other concentrations. Students complete their degree with a 5 to 8 credit

internship. All students in this concentration must hold a prior health professional degree or be enrolled in a joint or concurrent graduate program. To be eligible for the accelerated option, applicants must hold a terminal degree in a health or health-related field.

The online Public Health Practice curriculum begins with the 5 core courses and then offers two or more courses in epidemiology, environmental health, public health management and policy and social and behavioral sciences. Students complete their degree with a 5 to 8 credit internship. Online students are not available to pursue the MPH on campus in Gainesville, either due to employment or geographic distance.

Social and Behavioral Sciences

Master of Public Health (MPH) degree, concentration in social and behavioral sciences.

The social and behavioral sciences concentration is based on the assumption that health and health behavior are influenced by multiple psychological, behavioral, social, and cultural factors. Central to addressing health problems and eliminating health disparities and inequalities, these factors must be understood and addressed using a framework that explores multiple levels (individual, interpersonal, organizational, community, and population) and the interactions among them. Through classroom instruction, research, and field practice, MPH students who concentrate in social and behavioral sciences explore the unique issues faced by diverse groups and populations and acquire skills to achieve social and behavioral change. Students in the social and behavioral sciences concentration are required to take five courses: PHC 6251 (Assessment and Surveillance in Public Health), PHC 6146 (Public Health Program Planning and Evaluation), PHC 6700 (Social and Behavioral Research Methods), PHC 6937 (Special Topics: Public Health Information for Diverse Populations), and PHC 6937 (Special Topics: Foundations of Social and Behavioral Science Theory). In addition, they may choose two courses from six concentration electives (e.g., PHC 6762, PHC 6441). Social and behavioral science students complete their programs with an internship (PHC 9646) and elective courses in public health or related fields.

Visit the social and behavioral science concentration website for the most up-to-date information about course options: http://www.mph.ufl.edu/concentrations/socialbehavioralsciences.htm

The website of Department of Behavioral Science and Community Health provides additional information about activities and other academic programs in the department: http://bsch.phhp.ufl.edu/

PHC 6146: Public Health Program Planning and Evaluation (3) Second of two courses providing skills to develop and implement public health programs. Focuses on six steps in the rational planning process. Emphasizes evidence-based public health principles, organizational influences, and other contemporary themes of program planning.

PHC 6251: Assessment and Surveillance in Public Health (3) Knowledge, skills, and methods for conducting community assessments and surveillance to inform design of social and behavioral interventions.

PHC 6441: Health Disparities in the United States (3) Determinants that influence health outcomes of the most disadvantaged populations in the U.S., with special attention to racial, ethnic, and gender status.

PHC 6700: Social and Behavioral Research Methods(3) Research methods and their specific applications to public health issues.

PHC 6762: International Public Health (3) Overview of international public health, with special attention to economically disadvantaged populations and those affected by pandemics and by emerging and re-emerging diseases.

PHC 6937: Special Topics in Public Health(1-6; max: 12)

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Public Health and Health Professions

College of Public Health and Health Professions

Chair and Graduate Coordinator: J. Foss. *Complete faculty listing by department*: Follow this link

The following courses are offered under the supervision of the office of the dean by an interdisciplinary faculty and deal with specialized topics or material involving two or more health professions areas. These courses are also open to students of other colleges, with the permission of the course instructor.

HSC 5938: Special Topics (1-6; max: 12)
HSC 6905: Independent Study (1-3; max: 12)
HSC 6939: Special Topics (1-5; max: 10) S/U option.
HSC 6940: Supervised Teaching (1-5; max: 5) S/U.
PHC 6403: Adolescence, Risk Taking and Health(3) Introduction to primary determinants and outcomes associated with adolescent risk behaviors. Emphasis on substance use, sexual behaviors, injury, violence and the interactive nature of risk taking behaviors.

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Rehabilitation Science

College of Public Health and Health Professions

Graduate Faculty

Director: W. C. Mann. *Graduate Coordinator:* M. Odom. *Complete faculty listing by department*: Follow this link

The interdisciplinary Ph.D. program in rehabilitation science is offered through the College of Public Health and Health Professions. It is designed to prepare rehabilitation scholars. Students are given the opportunity to develop skills in teaching, research, service leadership, and interdisciplinary teamwork. Students work closely with their faculty mentor within the broad categories of Movement Science, Disability Science, and Communication and Swallowing Science. On successful completion of the program, graduates typically take positions in research universities and research centers. Requirements for the Ph.D. degree are given in the *General Information* section of this catalog.

Admissions decisions are determined by an interdisciplinary admissions committee. The program is a minimum of 90 credit hours of study beyond the bachelor's degree. The curriculum includes 25 graduate credits in core rehabilitation courses (rehabilitation science theory, research, and teaching) required of all students; 50 credits in specialty areas; and 15 credits of dissertation research. The 50 credits of specialty courses includes 18 credits from one (or a combination) of the three major emphases in rehabilitation mentioned above. The remaining 32 credit hours may be electives, or 30 credits may be transferred in from a master's degree program (with the approval of the supervisory committee. Specialty course work must be chosen by the student with

supervisory committee input and approval.

PHT 5156: Exercise Physiology (3) *Prereq: M.H.S. student.* Metabolic, muscular, cardiovascular, and pulmonary responses to acute and chronic exercise with application to patient populations.
PHT 6125C: Concepts in Clinical Biomechanics (3) *Prereq: PHT 6105C.* Analyzes joint biomechanics and forces acting on those joints during human motion. Describes their relationship to injury and rehabilitation.
PHT 6127C: Control of Gait and Posture (3) Influence of central and peripheral mechanisms on control of gait posture in healthy and patient populations.
PHT 6167C: Applied Neurophysiology for Physical Therapy (3) *Prereq: PHT 6166C.* Neurophysiological basis of movement, posture, sensation, and special sensory systems with functional application to physical therapy evaluation and treatment.
PHT 6236C: Neurological Dysfunction as Applied to Physical Therapy (4) Advanced peripheral and central nervous system neurology, evaluation, and therapeutic methods for neurological dysfunction.
PHT 6316: Neurological Aspects of Orthopedic Rehabilitation (3) Current concepts of neuroscience and motor control and their implications to orthopedic rehabilitation. Recent and relevant literature. Emphasizes incorporating both basic and clinical science evidence in designing therapeutic interventions.
PHT 6615L: Research Instrumentation in Physical Therapy (3) Current theory and practical application of techniques for the understanding and design of research projects related to physical therapy. S/U.
PHT 6718: Neuroplasticity: A Foundation for Neurorehabilitation (3) Evidence for plasticity after injury or disease. Factors that influence recovery. Medical approach to enhancing recovery. Potential approaches in physical rehabilitation to facilitate and optimize plasticity.
PHT 6935C: Seminar in Physical Therapy I (1-3; max: 9) *Prereq: consent of instructor.* Current topics in physical therapy.
RSD 6110: Rehabilitation Science Theory and Application I (3) Philosophical and theoretical foundations. History of the development of rehabilitation services and funding. Evolution of health care systems in the U.S.
RSD 6112: Rehabilitation Science Theory and Application II (3) *Prereq: RSD 6110.* Current issues and trends, social and political influences, ethical issues, and professional roles and credentialing as they relate to rehabilitation science and service delivery.
RSD 6114: Rehabilitation in the United Kingdom (3) *Prereq: certified rehabilitation professional.* Comparative study through on-site visits in the United Kingdom.
RSD 6400: Models and Principles of Motor Learning and Control: Application in Rehabilitation Science (3) Major themes, theoretical frameworks, and principles drawn from motor learning

and control research that influence evidence-based therapeutic practice and research.

RSD 6700: Rasch Measurement: Introduction and Application(3) *Prereq: for doctoral students.* Applying Rasch measurement to social and health science data. Rasch pertains to Item Response Theory approaches used to analyze educational, survey, self-report, and clinical data; and is a precursor to computerized adaptive testing.

RSD 6705: Research Methods in Rehabilitation (4) *Prereq: graduate-level statistics.* Research measurement and theory applied to rehabilitation. Research design.

RSD 6900: College Classroom: Teaching Process and Practice (3) Information and skills required for successful teaching faculty in college classroom.

RSD 6905: Individual Work (1-4; max: 12) *Prereq: RSD 6112, consent of adviser, and project approval.* Special project or research.

RSD 6910: Supervised Research (1-5; max: 5) S/U.

RSD 6930: Special Topics in Rehabilitation Science (1-4; max: 9) *Prereq: RSD 6112, 6705.*

RSD 6940: Supervised Teaching (1-5; max: 5) S/U.

RSD 7979: Advanced Research (1-4; max: 12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study of for student who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

RSD 7980: Research for Doctoral Dissertation (1-15) S/U.

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Religion

College of Liberal Arts and Sciences

Graduate Faculty

Chair: D. G. Hackett. *Graduate Coordinator:* M. A. Vasquez.
Complete faculty listing by department: Follow this link

The Department of Religion offers the Master of Arts and Doctor of Philosophy degrees in three specialty fields:

Religion in the Americas
Religions of Asia
Religion and nature.

Minimum requirements for these degrees are given in the *General Information* section of this catalog.

The first two specialty fields provide advanced education in the academic study of religion focusing on the religions and religious experiences of indigenous peoples. The third specialty field addresses the religious and ethical dimensions of human attitudes and practices regarding the natural world. Specific and current requirements are given at http://religion.ufl.edu under "Graduate Program." In special instances, and with the agreement of the supervisory committee and two sponsoring faculty members, master's degree students may choose an area outside the three specialty fields.

In addition to materials requested by the Graduate School for admission, applicants must send directly to the Religion Department the following evidence of aptitude and interest:

Three references from persons competent to evaluate the applicant's potential for graduate work
An essay of 3 to 5 double-spaced, typewritten pages identifying the applicant's goals and particular interests pertinent to the three available specialty fields (this essay is extremely important and applicants should attend to it carefully)
A writing sample.

Beyond these requirements, applicants need to show clear evidence of solid preparation before admission. This usually includes formal study of the primary language in the specialty field. Acceptable scores on the GRE General Test are required. In addition to evidence of preparation and academic promise, the Department gives careful consideration to the fit between an applicant's central scholarly interests and the resources the Department and University have to offer.

Master of Arts: The M.A. degree provides a broad background in the study of religious traditions, theoretical orientations in the discipline, and an initial concentration in one of the three specialty fields. Course work culminates in a thesis and oral examination on the thesis and course work.

Total credits: Thirty credit hours are required. These include Method and Theory I and II, the core course(s) of the major field (or equivalent for those not in one of the three specialty fields), and 6 hours of thesis research credits. The additional hours shall consist of further courses in the specialty field, other graduate seminars, and up to 6 hours of research language study.

Language study: All M.A. students are required to demonstrate competency in a scholarly language other than English before beginning the thesis. Most languages are acceptable, though students should consult the individual field requirements. The chosen language must be approved by the student's mentor and the graduate coordinator.

Thesis: Each student, guided by a supervisory committee, will prepare a Master of Arts thesis, acceptable to the Department of Religion and the Graduate School, and undergo an oral examination.

Promotion to doctoral status: The Department anticipates admitting only the best qualified M.A. students to the doctoral program. Resident graduate students who wish to apply for doctoral status (i.e., permission to fulfill requirements leading to doctoral qualifying examinations) must apply during the semester before they wish that status to be changed. A review and decision will be made by the

field faculty and the graduate committee.

Doctor of Philosophy: The Ph.D. program trains future scholars to conduct original research and teach in colleges, universities, and other educational, governmental, and nongovernmental institutions. A student usually enters with a religion master's degree either from this or another institution. Those admitted with master's degrees in disciplines other than religion may petition to bypass the religion master's degree with additional religion course work. All students are admitted into one of the three specialty fields and must fulfill the requirements of that field, as outlined. In addition, all students are encouraged to take courses in other departments to support work in their specialty field.

Course requirements: The University of Florida requires 90 hours of course work for the Ph.D. These may include up to 30 hours from a completed M.A. degree. The number of hours credited toward the Ph.D. is at the discretion of department faculty. A minimum of 45 hours is devoted to course work at the doctoral level. The specific distribution of course work depends on the specialization but will include intensive work in the major area of specialization, 6 hours of method and theory (If not taken at the M.A. level) and 15 hours devoted to dissertation writing and research.

Language requirements: All doctoral students must demonstrate proficiency in at least one and in many cases two languages other than English. The chosen language(s) as well as how and when the student's competence will be judged must be approved by the student's supervisory committee chair. Frequently language competence is documented by 1) taking an appropriate course or courses in the language with a grade of "B" or better, or 2) passing a translation exam (usually administered by a department member or a language department at the University). Basic course work for scholarly languages will not count toward the required 90 credit hours. However, students studying a scholarly language connected to their research needs (above and beyond basic competence) can receive 6 (or more) credit hours for such advanced courses toward the required 90 total credit hours, with approval of the student's supervisory committee chair.

Qualifying examinations: Qualifying examinations form a bridge between course work and dissertation research. Normally students will take qualifying examinations during their third year in residence. The precise areas of questioning and the reading list are decided by the supervisory committee in consultation with the student, well in advance of the examinations, but no later than the beginning of the term in which the student intends to take the qualifying examinations.

Dissertation proposal: Each doctoral candidate submits a formal dissertation proposal to the candidate's supervisory committee

chair at least 3 weeks before the end of the semester after the qualifying examination.

Admission to candidacy: On successfully completing the qualifying examination and the dissertation proposal, and all other course and language requirements, and with the approval of the supervisory committee, students make formal application to the Department and Graduate School for admission to Ph.D. candidacy.

Dissertation and its defense: The final years of the program are devoted to dissertation research and writing. The student is expected to present the completed dissertation and defend it at a public oral defense conducted by the supervisory committee.

Mentoring: Each student is assigned a faculty mentor on admission to the program, based on expressions of faculty interest and the student's intended area of concentration. The mentor and graduate coordinator answer questions and provide support for the student in choosing courses and planning a program. By the end of the second semester, all master's degree students must designate their supervisory committee chair and one additional department committee member. By the end of the second semester, all doctoral students must designate their committee chair. By no later than the end of the fourth semester of study, all doctoral students must designate a four-member supervisory committee including the chair and one member from outside the department. For details about the programs listed above, visit http://www.religion.ufl.edu.

REL 5143: Religion and Social Change (3) Religion's role in social movements and other forms of cultural, economic, and political transformation.
REL 5195: Topics in Religion and Society (3; max: 6) Examines the interaction between religious bodies and the structures of the societies in which they function, with particular attention to the United States.
REL 5297: Topics in Biblical Studies (3; max: 9) Examines methods of interpreting particular texts or themes chosen from Hebrew scriptures or the Christian New Testament.
REL 5338: Topics in Asian Religions (3; max: 9) Examines religious traditions that are indigenous to India, China, or Japan.
REL 5348: Buddhism across Boundaries (3) Cross-cultural history of Buddhism from the perspective of selected primary and secondary sources.
REL 5365: Studies in Islam (3; max: 9) Historical study of development of selected doctrines, institutions, and practices, using primary and interpretive material.
REL 5396: Religion and Animals (3) Examines the place of animals in the cosmologies and ethical systems of the world's diverse religions.
REL 5495: Topics in Religious Thought (3; max: 9) Investigation of particular themes in a religious tradition or the comparative

approach to intellectual dimensions of religious communities.
REL 5549: Studies in Christianity (3; max: 9) Historical study of the development of selected Christian practices, doctrines, and institutions, using primary sources and interpretative material.
REL 5696: Topics in Jewish Thought (3; max: 9) Themes, issues, and personalities in the Jewish tradition, from the biblical period through modern times.
REL 5906: Individual Work (1-5; max: 12) Study of chosen materials under the individual direction of a member of the Graduate Faculty. Plan of study and method of evaluation must be pre-approved by the supervisory committee.
REL 5937: Topics in Religious Studies (3; max: 9) Issues and methods in the study of religion. Generally more than one religious tradition is studied.
REL 6035: Method and Theory I (3) *Prereq: graduate standing. Required of all religion graduate students.* Examines classical formulations of approaches to studying religion and to developing religious studies as an academic discipline.
REL 6036: Method and Theory II (3) *Prereq: REL 6035 and graduate standing. Required of all religion graduate students.* Study of religion in light of recent challenges in the humanities and social sciences. Special attention to the concept of religion and its origins in Christian culture of Western Europe; and to the engagement of religion in colonial culture.
REL 6095: Utopias and Dystopias (3) Ideal societies and their roles in religious movements, ideologies, and communities.
REL 6107: Core Seminar in Religion and Nature(3) Religious dimensions of relationships between what humans call "nature" and "culture."
REL 6125: Religion and Politics in the Americas(3) Relationship between socio-political change and religion in the Americas from the pre-colonial period to the present.
REL 6129: Hindu Traditions in America(3) Exploration of cultural, religious, and social issues.
REL 6137: Religion in North America (3; max: 6) Examines religious bodies in the United States, from historical, sociological, and theological perspectives.
REL 6138: New Religious Movements (3) New, emerging, or alternative religious groups likely to receive the pejorative label of cult; types of leadership, organization, ritual, and ideology of such groups.
REL 6139: Religion in the Americas(3) Origins and interactions of religions in the Americas.
REL 6167: Radical Environmentalism (3) Critically examines the emergence and social impact of radical environmental groups.
REL 6181: Ethics and the Natural Sciences (3) Perspectives on the intersection of ethics and natural sciences, focusing on bioethics and health care, evolution, ecology, and ethology.
REL 6183: Religion and Environmental Ethics(3) Explorations in classic and contemporary theories and applications of environmental ethics, with special attention to religion.

REL 6186: Nature in Western Traditions(3) Introduction to major issues and approaches in relations between humans and nature in western religious traditions.
REL 6187: Nature in Asian Religions (3) Explores themes such as interconnectedness and interdependence, nonexclusivity, and biocentrism in ethical systems of religious traditions of Asia.
REL 6196: Globalizing the Sacred (3) Examines the ways that religion shapes the current multifaceted episode of globalization.
REL 6319: Interpreting Asian Religions (3) Critical assessment of the world-religions model for interpreting Asian religions.
REL 6339: Women in the Hindu Tradition (3) Classical Hindu typologies of womanhood compared to alternative modern and contemporary models.
REL 6346: Buddhist Traditions(3) Comprehensive survey of main traditions.
REL 6347: American Buddhism(3) Exploration of relationship between Buddhism and American culture.
REL 6368: Islam in Asia (3) Survey of the spread, development, and diversification of Muslim societies across Asia.
REL 6372: Religion and Nature in South Asia (3) Examines how the different religious traditions of South Asia understand the natural world and how these traditions respond to contemporary environmental issues.
REL 6384: Religion and Nature in Latin America (3) Attitudes and practices regarding nature in Latin American religions, including Christian, indigenous, African-based, and "new" religions.
REL 6385: Native Religions in the Americas(3) Indigenous religious communities and traditions in North, Central, and South America.
REL 6386: Religion and the Latin American Diaspora(3) Exploration of how transnationalism interacts with religion to produce new forms of identity and community life among Latinos.
REL 6387: Religions in Latin America(3) Important historical developments and contemporary expressions of religions in Latin America.
REL 6397: Hindu Sacred Texts and Their Ritual Context (3) Focuses on the notion of aural revelation, and exploration of social and ritual context of sacred text. Traditions of recitation, music, verbal, and performative commentaries associated with transmission of holy words.
REL 6910: Supervised Research (1-5; max: 5) S/U.
REL 6940: Supervised Teaching (1-5; max: 5) S/U.
REL 6957: Overseas Studies in Religion(1-3; max: 9) S/U.
REL 6971: Research for Master's Thesis (1-15) Required of all candidates for the M.A. degree. S/U.
REL 7979: Advanced Research (1-15) *Prereq: consent of graduate coordinator.* Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been admitted to a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

REL 7980: Research for Doctoral Dissertation(1-15) S/U.
SRK 6905: Individual Study in Sanskrit (1-4; max: 9) *Prereq: consent of instructor.* Graduate reading in Sanskrit language and literature.

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Sociology

College of Liberal Arts and Sciences

Graduate Faculty

Chair: C. L. Shehan. *Graduate Coordinator:* R. Hollinger. *Complete faculty listing by department*: Follow this link

The Department of Sociology and Criminology & Law offers graduate programs in Sociology leading to the Master of Arts degree (thesis or nonthesis) and the Doctor of Philosophy degree with these areas of special emphasis:

--Environment and resource sociology
--Families, gender, and sexualities
--Health, aging, and the life course
--Race & ethnicity in the US and global context

Minimum requirements for the M.A. and Ph.D. degrees are given in the *General Information* section of this catalog.

Admission to either Sociology graduate program requires a bachelor's degree in Sociology or related social science as approved by the Department. Current UF students may also enter the M.A. program through the combined B.A./M.A. program. The Sociology graduate programs look for mature students with outstanding potential and research interests that complement those of our faculty. Advanced students also have opportunities to earn certificates in a number of minor areas including Social Science Methodology, European Studies, Latin American Studies, Public Health and Women's Studies.

Prospective students should examine the research interests of the Sociology Graduate Faculty to obtain a more detailed sense of faculty expertise and research areas (see the department website: http://www. soccrim.clas.ufl.edu). Applications for admission and fellowship support are due January 15th of each year. Students planning to apply for admission should take the Graduate Record Examination at the earliest possible date.

SYA 5933: Special Study in Sociology (3; max: 6)
SYA 6018: Classical Social Theories (3) Sociological theory from its inception in the early 19th century to about 1930. The ideas of Comte, Spencer, Marx, Weber, Simmel, Durkheim, Pareto, Mead, and others.
SYA 6126: Contemporary Sociological Theory (3) The study of modern sociological theories, roughly 1930 to the present.
SYA 6305: Methods in Social Research I (3) Survey of quantitative and qualitative methods of social research, design, and data collection.
SYA 6306: Methods in Social Research II (3) *Prereq: SYA 6305.* Evaluation and completion of topics and projects from SYA 6305.
SYA 6315: Qualitative Research Methods (3) Fieldwork, observation, participant observation, and other qualitative data-collection and analysis techniques.
SYA 6327: Research Problems in Deviance (3) Survey of substantive issues related to data sources, analysis methods, and specific research areas.
SYA 6407: Quantitative Research Methods (3) *Prereq: STA 6126.* Applying selected quantitative methods to sociological research problems. Extensive practice applying the methods.
SYA 6905: Individual Work (1-4; max: 3 for M.A. and 6 for post-M.A.) Work on subjects not available in currently offered courses.
SYA 6910: Supervised Research (1-5; max: 5) S/U.
SYA 6942: Applied Social Research Project (3) Supervised individual or team applied research project.
SYA 6971: Research for Master's Thesis (1-15) S/U.
SYA 7135: Sociology of Knowledge (3) Variations in the social origin of knowledge and knowledge systems.
SYA 7933: Special Study in Sociology (3; max: 9)
SYA 7935: Advanced Study in Sociology (3; max: 6) *Prereq: M.A. or equivalent degree in sociology.*
SYA 7979: Advanced Research (1-12; max: 24, including SYA 7980, may be counted in 90 hours) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
SYA 7980: Research for Doctoral Dissertation (1-15; max: 24, including SYA 7979, may be counted in 90 hours) S/U.
SYD 6436: Metropolitan Growth and Development (3) *Prereq: 8 hours in social sciences.* Examines the main facets of the

dynamics of urban growth/decline and how these affect the social order of a given population: population factors, formation/deterioration of community ties, urban housing social control, transportation, and other subjects reflecting the complexity of urban life.

SYD 6517: Seminar in Environment and Society (3) Survey of sociological topics important for interdisciplinary environmental science.

SYD 6636: Latin American Development (3) Analyzing social and economic development in Latin America. Industrialization, agrarian structure, the role of the state, and dependency.

SYD 6706: Racial and Ethnic Relations (3) Overview of racial-ethnic oppression, stratification, and conflict in the U.S.

SYD 6707: Black and White Americans: Sociological Perspectives (3) Critical and comprehensive overview of current social science research. Racial images and perspectives, racial attitudes, images in the media, responses to discrimination, and public policies such as affirmative action.

SYD 6807: Sociology of Gender (3) Theoretical and empirical literature about social construction of gender. Overview of key literature.

SYD 6825: Men and Masculinities (3) How men's life course influences and is affected by the gendered social order. How masculinities are constructed in diverse contexts.

SYD 7808: Reproduction and Gender (3) *Prereq: graduate standing.* Key reproductive issues in a U.S. context. The gendered nature of the reproductive realm. How cultural and social structures shape individuals' feelings, thinking, and actions in terms of specific reproductive choices.

SYO 6107: American Families (3) The impact on families of rapid social changes. Racial, class, and ethnic variations. Gender issues and changing family roles. Alternative life styles and the changing nature of families.

SYO 6126: Family Theories (3) Relationships, families, and households (RFH) from a social science (SS) perspective. Aims to synthesize elements of social theory, social research, and social policy.

SYO 6175: Topics in Family Research (3) Seminar on major empirical approaches to analyzing family relationships.

SYO 6407: Health Disparities (3) Health needs of vulnerable populations in the United States of America.

SYO 6427: Health and Aging(3) Graduate seminar that focuses on the determinants and character of chronic disease epidemiology among adults in the United States.

SYO 6535: Social Inequality (3) The unequal distribution among individuals and groups of wealth, power, and prestige. The effect of class systems on society. The effect of class membership on individuals. Social mobility.

SYO 6806: Gender and Society (3) Review of recent literature and field research on women, gender, and sexism. Barriers such as everyday discrimination.

SYP 6065: Sociology of Human Sexuality (3) Theoretical and conceptual issues, empirical research, and social policies germane to human sexuality. U.S. sexual identity and orientation. Sexuality from childhood to later years of life. Sexual behavior in and out of committed relationships. Incest. Social control of sexuality, including prostitution and pornography. Social implications of STIs and HIV/AIDS. Coercive sexuality. Gender relations and sexuality. Relationship between sexuality and the sociopolitical process.

SYP 6115: Seminar in Symbolic Interaction (3) A sociological perspective on the self, with special emphasis on the role of language, symbols, and culture in relation to identity, socialization, and social structure.

SYP 6515: Deviance (3) Advanced study of theoretical and empirical literature on deviance and its social construction.

SYP 6517: Theories of Crime and Deviance (3) Review and critique of major social and behavioral theories of crime, delinquency, and deviance.

SYP 6545: Sociology of Law (3) Sociological perspective on law and control in society, development of law, operation of the legal system, the legal profession, social change, power and conflict, and the impact of law and legal sanctions and society.

SYP 6735: Sociology of Aging and the Life Course (3) Social and personal conditions of post-retirement years. Family and housing patterns, income, leisure, health, group processes, and evaluation of institutional care of the aged.

SYP 6736: Sociology of the Aged (3) Major sociological issues and concepts related to aging and the aged. Social stratification, family, social norms, social networks, and community. Economic security, health, housing, and retirement.

SYP 6745: Aging and End-of-Life Issues (3) An exploration of dying well in old age from multiple perspectives, including sociology, psychology, biology, medical sciences, ethics, history, spirituality/religion, and economics.

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Soil and Water Science

College of Agricultural and Life Sciences

Graduate Faculty

Chair: K. R. Reddy. *Graduate Coordinator:* A.V. Ogram. *Complete faculty listing by department*: Follow this link

The Soil and Water Science Department offers Master of Science (thesis or professional option) and Doctor of Philosophy degrees in soil and water science with the following specializations: ecology, environmental science, hydrologic science, and soil science. Requirements for the, M.S., and Ph.D. degrees are given in the General Information section of this catalog.

Students can also develop specializations in several interdisciplinary areas including biogeochemistry, ecology, geographic information systems, hydrologic science, tropical agriculture, turfgrass management, and wetland science. The Department also offers Master of Science (thesis or professional option) specialization in environmental science via distance education for place bound students (http://soils.ifas.ufl.edu/distance). The Department emphasizes (but is not limited to) the following research areas:

--Nutrient, Pesticide, and Waste Management
--Soil, Water, and Aquifer Remediation
--Carbon Dynamics and Ecosystem Services
--Landscape Analysis and Modeling
--Wetlands and Aquatic Ecosystems

Interests of the student and faculty, the facilities, and funding available will determine the student's research area. A specific

program of study is prepared by an appointed supervisory committee for each student. Students will present a thesis or dissertation in their major field (M.S. thesis option and Ph.D.). In addition, Ph.D. candidates must pass a qualifying examination covering several areas of soil and water science and related fields.

Prerequisites: Students who expect to do graduate work in the Soil and Water Science Department should hold a bachelor's degree from an accredited college or university with a major in soil and water science or the equivalent background in another field of science. Graduate students should have backgrounds in biology, chemistry, physics, and mathematics and knowledge of basic soil and water science. Those students not meeting the above requirements will normally be expected to make up any deficiencies early in their graduate programs. Students will also be held responsible for basic undergraduate courses deemed necessary for their special programs.

The Department offers a combined bachelor's/master's degree program that permits a B.S. and M.S. degree to be completed in 5 years. Contact the graduate coordinator for information.

CWR 6536: Stochastic Subsurface Hydrology (3) *Prereq: senior-level course in probability and statistics, calculus through differential equations, soil physics, and/or subsurface hydrology.* Stochastic modeling of subsurface flow and transport including geostatistics, time series analysis, Kalman filtering, and physically based stochastic models.

CWR 6537: Contaminant Subsurface Hydrology (3) *Prereq: MAP 2302 or 4341 or equivalent; CGS 2420 or equivalent; SWS 4602C or ABE 6252 or CWR 5125 or 5127 or equivalent; or EES 6208 or equivalent.* Physical-chemical-biological concepts and modeling of retention and transport of water and solutes in unsaturated and saturated media. Applications of environmental aspects of soil and groundwater contamination.

SWS 5050: Soils for Environmental Professionals (3) Fundamentals of soil properties and processes that explain the central role soils play in the environment. Geared to environmental professionals with little knowledge of soil science. Also offered as a distance education course.

SWS 5050L: Soils for Environmental Professionals Laboratory (1) *Coreq: SWS 5050 or consent of instructor.* Hands-on laboratory experience with many tools and techniques used in soil and water science, in relation to the environment. S/U.

SWS 5115: Environmental Nutrient Management (3) *Prereq: SWS 3022 or 5050.* Consumption, manufacture, properties, and reserves of fertilizer materials. Methods of application, effects on soil reaction, and plant requirements of fertilizer nutrients. Understanding specific fertilizer reactions. Also offered as a distance education course.

SWS 5132: Tropical Soil Management (3) *Prereq: SWS 3022 or*

5050. Characteristics and management of tropical soils. Technologies that minimize industrial inputs.

SWS 5234: Environmental Soil, Water, and Land Use (3) Suitability of soils for different uses. Proper use of soil survey reports, topographic maps, and related information. Relationships between land uses and water behavior in soils and landscapes. Water use and allocation. Also offered as a distance education course.

SWS 5235: South Florida Ecosystems (3) Five modules address major disciplines of science and interest. Modules focus on broad subject areas critical to understanding this framework and man's interaction with South Florida ecosystems.

SWS 5246: Water Resource Sustainability (3) Quantitative description of human impacts on hydrologic ecosystems (aquifers, watersheds, coastal zones, lakes, and wetlands). Case studies show the detrimental effects of unsustainable resource use and beneficial management strategies. Also offered as a distance education course.

SWS 5247: Hydric Soils (2) Concepts, field identification, and delineation of hydric soils. Instruction in accordance with the National Technical Committee for Hydric Soils and with regulatory agencies.

SWS 5248: Wetlands and Water Quality (3) *Prereq: CHM 2040.* Introduction to natural and constructed wetland ecosystems. Problems associated with eutrophication and water quality. Hydrology, soils, and biogeochemistry. Also offered as a distance education course.

SWS 5305C: Soil Microbial Ecology (3) *Prereq: SWS 3022 or 5050, MCB 2000C.* Occurrence and activities of soil microorganisms and their influence on soil productivity and environmental quality. Also offered as a distance education course.

SWS 5308: Ecology of Waterborne Pathogens (3) *Prereq: MCB 3020 or MCB 4203 or equivalent.* Modern methods for molecular and cultivation-dependent identification of soil- and waterborne pathogens. Risk assessment. Survival strategies, gene regulation, and metabolism of waterborne pathogens outside of their mammalian hosts. Also offered as a distance education course.

SWS 5406: Soil and Water Chemistry (3) *Prereq: SWS 3022 or 5050; CHM 3120.* Theoretical background and current approaches to agricultural and environmental problems. Also offered as a distance education course.

SWS 5424C: Soil Chemical Analysis (3) *Prereq: CHM 3120.* Practical and theoretical aspects of instrumentation and techniques commonly used in analyzing soils and plants.

SWS 5551: Soils, Water, and Public Health (3) *Coreq: Graduate status.* Highlights important instances where soil and water science and public health overlap. Develops skills required for competency in both disciplines.

SWS 5605C: Environmental Soil Physics (3) *Prereq: CHM 2040, MAC 2312, PHY 2004, SWS 5050.* Transport processes for water, solutes, gases, and heat in the root zone. Important soil properties

(physical, chemical, and biological) that influence the transfer processes characterized in the field and laboratory.

SWS 5716C: Environmental Pedology (3) *Prereq: SWS 3022, 5050, or consent of instructor.* Soils in the environment. Heavily oriented toward field applications of pediogical principles and processes. Also offered as a distance education course.

SWS 5720C: GIS in Land Resource Management(3) Introduction to basic concepts and use of "Arc GIS" to address land resource management issues. Also offered as a distance education course.

SWS 6134: Soil Quality (3) *Prereq: SWS 5050 or consent of instructor.* State-of-the-art studies/knowledge on soil quality. Principle assessment of soil quality with respect to biological production, plant and animal health, food security, and environmental quality.

SWS 6136: Soil Fertility (3) *Prereq: SWS 4116, 4213C, 5050 or 5406 or EES 4201.* Principles of advanced soil fertility, including soil chemical properties, crop management practices, plant nutritional requirements, soil fertility amendments, and physiological aspects of plant growth.

SWS 6161: Bioavailability of Soil Nutrients (3) *Prereq: SWS 3022 or 5050, 4116 or equivalent, or consent of instructor.* Soil water regime, soil chemical reactions, and dynamic nature of root growth and root function as they influence and determine nutrient availability. Also offered as a distance education course.

SWS 6262: Soil Contamination and Remediation (3) *Prereq: SWS 4213C or equivalent.* Interdisciplinary study on current topics of soil contamination (types, sources, pathways, impacts, and fates) and soil remediation technologies (chemical, physical, biological, and thermal). Also offered as distance education course.

SWS 6323: Advanced Microbial Ecology (3) *Prereq: SWS 5305C or consent of instructor.* Phylogeny and evolution; diversity of habitat; genetic exchange.

SWS 6325: Rhizosphere Biochemistry (3) *Prereq: SWS 5305 or SWS 6323 or consent of the instructor.* Signaling and gene regulation in rhizosphere. Roles of plants and microbes in nutrient cycling, plant disease, biocontrol, and bioremediation.

SWS 6366: Biodegradation and Bioremediation (3) Principles of biodegradation of toxic organic chemical; practices in conducting biodegradation studies in soils and water, and in microbial aspects of bioremediation of contaminated soils and water.

SWS 6373: Techniques in Microbial Ecology (2; max: 4) *Prereq: SWS 5305 or SWS 6323 or equivalent.* Review of techniques for studying in situ gene expression, signaling, gene transfer, and functional and genetic diversity of microbial communities. Lecture and discussion.

SWS 6448: Biogeochemistry of Wetlands (3) Biogeochemical cycles of carbon, nitrogen, phosphorus, sulfur, and redox cations in wetland soils and sediments, as related to their agronomic, ecological, and environmental significance. Also offered as distance education course.

SWS 6454: Advanced Soil and Water Chemistry(3) *Prereq: CHM*

3400, or equivalent. Fundamental principles of surface chemistry as applied to soil and subsurface materials in natural waters. Chemical equilibria in natural systems, aqueous geochemistry, interfacial properties of soil and sedimentary colloids, and sorption of pollutants.

SWS 6456: Advanced Biogeochemistry(3) Global elemental cycles in terrestrial, wetland, and aquatic systems as related to water quality, carbon sequestration, and climate change.

SWS 6464C: Soil Mineralogy (4) *Prereq: consent of instructor.* Classification, structure, surface chemistry, equilibria, genesis, weathering, and distribution of soil minerals. Influence of minerals on soil properties.

SWS 6622: Vadose Zone Hydrology (3) *Prereq: SWS 4602C, MAC 2313, EGM 3311, or equivalent.* Physical concepts for movement and retention of water, solutes, and heat in the water-unsaturated vadose zone with emphasis on agricultural and environmental aspects of water and solutes in soils.

SWS 6717: Soil Genesis and Classification (3) *Prereq: SWS 4715C.* Philosophic concept of soil, role of soil models, development and nomenclature of diagnostic horizons, and an analysis of soil taxonomy. Several field trips are required.

SWS 6722: Soil-Landscape Modeling(3) *Prereq: SWS 5720C, STA 6166, SWS 5716c, or equivalent, or consent of instructor.* Various concepts and quantitative methods to model and understand spatial distribution of soil properties.

SWS 6905: Special Problems (1-4; max: 8) *Prereq: 15 credits of soil science.* Laboratory, library, and/or field study and research in a particular aspect of soils. Also offered as a distance education course.

SWS 6910: Supervised Research (1-5; max: 5) Also offered as a distance education course. S/U.

SWS 6931: Seminar (1; max: 3) Presentation of literature, methods of proposed thesis research, and selected topics.

SWS 6932: Topics in Soils (1-4; max: 8) *Prereq: SWS 3022.* Also offered as a distance education course.

SWS 6940: Supervised Teaching (1-5; max: 5) Also offered as a distance education course. S/U.

SWS 6971: Research for Master's Thesis (1-15) Also offered as a distance education course. S/U.

SWS 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. Also offered as a distance education course. S/U.

SWS 7980: Research for Doctoral Dissertation (1-15) Also offered as a distance education course. S/U.

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Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Spanish and Portuguese Studies

College of Liberal Arts and Sciences

Chair: D. Pharies. Graduate Coordinator: R.JimÃ©nez

Complete faculty listing by department: Follow this link

The Department of Spanish and Portuguese Studies offers a program leading to the Ph.D. in Romance Languages and Literatures, with a concentration in Spanish, and the M.A. in Spanish (thesis or nonthesis). Minimum requirements for the M.A. and Ph.D. degrees are given in the *General Information* section of this catalog.

Candidates for graduate degrees (both M.A. and Ph.D.) in Spanish have two options--literature or linguistics. In conjunction with their master's or doctoral work, students may also earn a Certificate in Latin American Studies. Though a graduate degree is not offered in Portuguese, extensive course offerings at the graduate level permit students to develop a strong specialization in Portuguese language and Luso-Brazilian literature.

Prerequisite for admission to the M.A. program is an undergraduate major in Spanish, ideally including advanced courses in the proposed area of specialization. Applicants for the Ph.D. should hold an M.A. in Spanish or an equivalent degree. Strong candidates from allied fields of study are sometimes accepted for the Ph.D. conditional upon their completing additional course work and taking the M.A. Comprehensive Examination.

All M.A. and Ph.D. students specializing in literature and culture must take Introduction to Graduate Study and Research (SPW 6806). All M.A. and Ph.D. students in Spanish who are assigned to teach must take Romance Language Teaching Methods (SPN 6940, 6943). Other requirements vary with degree and specialization. For details, consult the graduate coordinator.

The Department is able to offer most students a teaching assistantship that provides a maintenance stipend and includes a tuition waiver. Contingent on positive performance in teaching and graduate work, normally an M.A. student can count on at least four semesters of support and an M.A./Ph.D. student has at least ten semesters. In addition, there are several fellowships, supplements and stipends for which students may apply, and summer teaching may be available.

Incoming students are encouraged to apply as early as possible, preferably a full year ahead, since some deadlines for submitting applications occur during the fall of the year prior to enrollment. All materials for applications to either program must be sent by February 1 (international applicants) or April 1 (domestic applicants). For current information about graduate programs in the Department, visit http://www.spanishandportuguese.ufl.edu/.

There is a combined B.A./M.A. program in Spanish that allows up to 12 graduate credits to be counted toward fulfillment of both degrees. Contact the graduate coordinator for qualifications and details.

FOL 6326: Technology in Foreign Language Education (3) *Prereq: SPN 6943, FRE 6943, or equivalent.* Technology in classrooms. The interface between pedagogy and technology.
FOW 6930: Special Study in Romance Languages and Literatures (1-3; max: 9) Rotating topics in literary theory, cultural studies, or literary study involving two or more Romance languages.

Portuguese

POW 6276: Twentieth-Century Brazilian Novel (3) Readings in narrative from 1920s avant-garde and 1930s neoregionalism to 1950s and 1960s instrumentalism. Various manifestations of late-century prose fiction.
POW 6385: Brazilian Lyric (3) Theory and practice of poetry including Modernist legacy, experimental trends, political verse, song, youth movements, and contemporary phenomena.
POW 6386: Brazilian Drama (3) Theory of dramatic literature and theatre, from its origins in the 19th century through Modernism and contemporary practices.
POW 6905: Individual Work (1-3; max: 9) Available only by special arrangement with program coordinator or graduate adviser.

POW 6930: Rotating Topics in Brazilian or Portuguese Literature (3; max: 9) Diverse themes of the Lusophone world, including Portuguese Modernism, Brazilian northeast, Afro-Brazilian world, culture of dictatorship, popular music, science fiction, postmodernism, or focus on major authors (Machado de Assis, Guimaraes Rosa, Clarice Lispector).

Spanish

SPN 6166: Teaching Spanish for the Professions (3) Practical training and orientation for graduate students. Business Spanish. Issues of Spanish for health care and other professions. Languages across the curriculum. Professional development: technology in the classroom, scholarly networking, and job search.
SPN 6315: Advanced Composition and Syntax (3) Extensive practice producing various types of academic writing in Spanish. Discursive and grammatical features that distinguish different styles.
SPN 6715: Formal Instruction and Acquisition of Spanish (3) Effects of formal instruction on acquisition of Spanish as a foreign language. Combination of general theoretical issues with analysis of different aspects of teaching and learning Spanish grammar.
SPN 6735: Special Study in Spanish Linguistics (3; max: 12) Varying topics of Spanish linguistics relevant to second language acquisition, sociolinguistics, and historical linguistics.
SPN 6785: Advanced Spanish Phonetics (3) Precise description of Spanish pronunciation. Dialect features and contrastive English phonetics.
SPN 6827: Sociolinguistics of the Spanish-Speaking World (3) *Prereq: SPN 6785.* Overview of issues in the contemporary Spanish-speaking world: language variation, language contact, discourse analysis, language attitudes, policy and planning, and social factors in language acquisition and use.
SPN 6835: Spanish and Spanish-American Dialectology (3) *Prereq: SPN 6785.* Principles and methods applied to study of regional varieties of Spanish in Spain and Spanish America.
SPN 6845: History of the Spanish Language (3) Phonological, morphological, syntactic, and lexical evolution of Spanish language from Latin.
SPN 6848: Medieval Spanish Linguistics(3) *Prereq: SPN 6845.* In-depth examination of medieval Spanish to familiarize students with all aspects of language, primarily through detailed analysis of nonliterary texts of period.
SPN 6855: Structure of Spanish (3) Morphological, syntactic, and semantic aspects of the Spanish language.
SPN 6856: Spanish in Contact: Issues in Bilingualism (3) Structural and sociocultural analysis of the Spanish language in contact with other major languages: Quechua, Aymara, Guarani, Basque, Catalan, English, Portuguese, and African languages.
SPN 6900: Directed Readings in Spanish(3; max: 6) Individualized readings in preparation for Master of Arts comprehensive examinations. S/U.

SPN 6940: Supervised Teaching (1-5; max: 5) *Required for all graduate teaching assistants in Spanish.* Practical training in teaching elementary Spanish courses. S/U.

SPN 6943: Romance Language Teaching Methods (2; max: 6) *Prereq: graduate standing.* Required of all graduate students who will be involved in teaching and have not had a similar course elsewhere.

SPN 6945: Practicum in Advanced College Teaching (2; max: 6) Practical training and orientation for advanced doctoral students in teaching upper-division courses. Gain upper-level teaching experience by working closely with a mentor in all areas of the teaching process. S/U.

SPW 6209: Colonial Spanish-American Literature (3) Readings, research, and discussion. Literary, historical, and legal 16th-, 17th-, and 18th-century texts in Spanish: Colonial Latin America and dealing with contact among European, neo-European, and Native American cultures.

SPW 6216: Spanish Prose Fiction of the Golden Age (3) The literary landscape of rampant generic diversity, before novelistic forms solidified. While shepherds in rarified meadows disputed fine points of neo-Platonic love, thieves, prostitutes, and picaros inveighed their way into carriages, salons, and homes of aristocracy. Fiction provided an outlet for political satire, religious allegory, utopian dreaming, and sheer escapism. Readings and lectures in Spanish.

SPW 6236: Spanish-American Narrative from the Origins to Criollismo(3) Narratives of nineteenth-century dealing with issue of nation building and cultural independence after emancipation from Spain (authors include Sarmiento, Gomez de Avellaneda, Mera, Galvan, Issacs, Altamirano).

SPW 6269: Spanish Novel of the Nineteenth Century (3) Survey of Spanish narrative beginning with romantic cuadros de costumbres and folletin. Emergence of realist and naturalist narrative from 1870s to 1890s. Emphasizes Valera, Galdos, Clarin, and Pardo Bazan.

SPW 6276: Spanish Postwar Narrative (3) Analysis of significant texts up to the present, through the prism of pertinent critical discourses and historical readings.

SPW 6278: Postwar Spanish Fiction (3) Contextualized approach to representative works and significant authors of fiction published in Spain after 1939. Critical and historical readings and textual analysis.

SPW 6285: Contemporary Spanish-American Narrative I (3) Textual production of the 1940s and 1950s including broader cultural characteristics of modernization, development of new narrative modes, and theories of understanding Latin America and literature of this period.

SPW 6286: Contemporary Spanish-American Narrative II (3) Fiction in the 1960s and after, including the New narrative, the Boom, and the Post-Boom. Broader cultural characteristics. Theories of understanding the area and the literature of the period.

SPW 6306: Spanish-American Theater (3) Analyzing selected plays and films. Introduction to the history, theory, and practice of theatrical arts in the region. Comparison to theater elsewhere. Focuses on the 20th century.
SPW 6315: Spanish Drama of the Golden Age (3) *Comedia* in theory and practice. *Sacramental, entremes, comedia,* religious, and historical drama of 16th- and 17th-century Spain.
SPW 6337: Golden Age Poetry (3) Analysis of multiple uses of artifice in Renaissance and Baroque Spanish poetry by both major and minor poets.
SPW 6345: Twentieth-Century Spanish Poetry (3) Introductory survey of major poets. Topics include gender, periodization, aesthetics, historicity, and the relationship of poetry to politics. Close reading of texts in the context of contemporary literary theory.
SPW 6356: Spanish-American Poetry from Romanticism to Vanguardismo (3) Major movements from the mid-19th century to the 1930s, especially from Modernismo to the present. Seminal works of poets such as Marti, Casal, Cario, Lugones, Mistral, Storni, Huidobro, and Vallejo.
SPW 6357: Contemporary Spanish-American Poetry (3) Sentral aspects of Spanish-American poetry from Vanguardism to the present. Organized around a specific theme, genre, country, region, theoretical problem, or subperiod.
SPW 6366: Spanish-American Essay (3) Close reading and critical analysis of texts by major twentieth-century essayists. Themes include affirmation of identity, gender roles, and the definition of ethnic, racial, social, and class categories.
SPW 6606: Cervantes (3) Situates Don Quijote I, II in the cultural nexus of early modern Spain. Surveys contemporary currents in Cervantine criticism.
SPW 6729: The Generation of 1898 (3) Fin de siecle crisis. The rise of literary modernity and nationalism. Creation of modern intelligentsia in the early 20th century in the works of Unamuno, Costa, Maeztu, Antonio Machado, Baroja, and Valle-Inclan.
SPW 6806: Introduction to Graduate Study and Research (3) Tools, problems, and methods of literary research.
SPW 6902: Special Study in Spanish or Spanish-American Literature (3; max: 15) Selected topic or problem (varied each semester).
SPW 6905: Individual Work (1-3; max: 9) Available only by special arrangement with graduate adviser.
SPW 6910: Supervised Research (1-5; max: 5) S/U.
SPW 6934: Seminar in Spanish American Literature and Culture (3; max: 9) Analyzing themes and directions in contemporary Spanish American literature and culture. Feminist literary and cultural criticism. Reading and discussion of key theoretical texts produced in the U.S., Europe, and Latin America. Graduate students from other disciplines are welcome.
SPW 6938: Seminar in Spanish Literature and Culture (3; max: 9) *Prereq or coreq: SPW 6806.* Variable topics. Close consideration

of a single literary or critical or cultural problem arising in the context of Spanish letters or culture.

SPW 6971: Research for Master's Thesis (1-15) S/U.

SPW 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

SPW 7980: Research for Doctoral Dissertation (1-15) S/U.

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Special Education, School Psychology and Early Childhood Studies

College of Education

Acting Director: J. B. Crockett.
Graduate Coordinators: P. R. Cox; C. C. Griffin
The School of Special Education, School Psychology, and Early Childhood Studies offers online and face-to-face programs leading to the Master of Education (M.Ed., non-thesis), Master of Arts in Education (M.A.E., thesis), Specialist in Education (Ed.S.), Doctor of Education (Ed.D.), and Doctor of Philosophy (Ph.D.) degrees. Complete descriptions of the requirements for these degrees are provided in the General Information section of this catalog.

The School offers graduate study and research experience in 3 areas of specialization: Special Education; School Psychology; and Early Childhood Studies. Programs are accredited by the Florida Department of Education and approved by the National Council for Accreditation of Teacher Education (NCATE) through the Council for Exceptional Children (CEC) and the National Association of School Psychologists (NASP). The Ph.D. program in School Psychology is accredited by the American Psychological Association (APA).

EEC 6205: Early Childhood Curriculum (3) Students develop and/or implement instructional strategies consistent with their personal philosophies of early childhood education.
EEC 6304: Creativity in the Early Childhood Curriculum (3) Techniques for teaching all areas of the early childhood curriculum to support the development of children's creativity with an emphasis on art and music.
EEC 6525: Issues in Child Care Administration (3) Child care

background, curriculum, organization, staffing, training of staff, parent education and involvement, funding, and research.
EEC 6615: Early Childhood Education: Background and Concepts (3) Trends in the teaching of nursery and kindergarten children as shown in past and current educational theory.
EEC 6946: Practicum in Early Childhood Education (1-6; max: 11) Supervised experience in a variety of early childhood settings with weekly seminars.

Early Childhood Education

Acting Director: J. B. Crockett.
Graduate Coordinators: P. R. Cox; C. C. Griffin.

EEC 6933: Special Topics (1-12; max: 12) *Prereq: Consent of instructor.* Selected topics in the theory and practice of early childhood education not included in the established curriculum.
EEC 7979: Advanced Research() *Prereq: Designed for students with a masters' degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy.* Research for doctoral students before admission to candidacy. S/U.

School Psychology

School Psychology: (M.Ed.,Ed.S., Ph.D.)
The School Psychology Program (SPP) prepares school psychology practitioners and scholars whose activities promote the psychological and educational development and well-being of children and youth. The program is grounded in a scientist-practitioner model as reflected in its commitment to a synthesis between science and practice throughout all academic and professional preparation opportunities. Specialist training consists of 80 graduate credit hours, including a year-long internship, and leads to the Ed.S. degree. Doctoral training consists of 136 graduate credit hours, including a year-long internship, early research experience, and dissertation, and leads to the Ph.D. degree.

SPS 6052: Issues and Problems in School Psychology (3) *Coreq: SPS 6941.* History and foundations of school psychology; legal and ethical. Overview of the role and functions of the school psychologist.
SPS 6191: Psychoeducational Assessment I (3) *Coreq: SPS 6941.* Techniques for assessing intelligence, adaptive behavior, and achievement of children and school-aged adolescents. Emphasizes standardized instruments.
SPS 6192: Psychoeducational Assessment II (3) *Prereq: SPS 6191. Coreq: SPS 6941.* Techniques for assessing the social and emotional functioning of the school-aged child; supervised

experience in assessment and report writing.
SPS 6193: Academic Assessment & Intervention (3) Assessment approaches and intervention strategies for students experiencing academic difficulties.
SPS 6195: Developmental Psychopathology (3) Overview of developmental psychopathology and its relationship to diagnosis and intervention for children and adolescents.
SPS 6197: Psychoeducational Assessment III (3) *Prereq: SPS 6191. Coreq: SPS 6941.* Synthesis of sources and techniques of psychoeducational assessment for school-related application and problems.
SPS 6410: Direct Interventions I: Applied Behavior Analysis for School Psychologists (3) *Coreq: SPS 6941.* Theory and research of applied behavior analysis for school psychologists to provide systematic assessment and treatment.
SPS 6707: Interventions in School Psychology II: Cognitive Behavioral Interventions(3) *Prereq: SPS 6410.* Theory and practice of cognitive behavior.
SPS 6708: Interventions in School Psychology III: System Level Interventions for Children and Youths(3) *Prereq: SPS 6707.* Theory, empirical research, and clinical issues related to primary prevention and crisis intervention.
SPS 6815: Law and Ethics in Psychology (3) Knowledge of laws and ethics that impacts psychological practice with emphasis on children and schools.
SPS 6941: Practicum in School Psychology (1-4; max: 8) *Prereq: consent of instructor.* S/U.
SPS 6942: School Psychology Practicum II (3; max: 6) *Prereq: SPS 6941.* Practicum focused on linking assessment and intervention. S/U.
SPS 6945: Advanced Practicum in School Psychology (3) *Prereq: SPS 6941 and SPS 6942.* Advanced practicum focused on complex case management, specialization area practice, diversity, and peer supervision. S/U.
SPS 7205: School Psychology Consultation (3) *Coreq: SPS 6941.* Concepts, processes, and issues related to the practice of school-based consultation as an intervention technique of school psychologists.
SPS 7931: Seminar in School Psychology (1-3; max: 3) *Prereq: consent of instructor.* Issues pertinent to the professional practice of school psychology.
SPS 7949: Internship in School Psychology (6 [3 Summer A or B]; max: 18) *Prereq: consent of instructor.*

Special Education

Special Education: (M. Ed, M.A.E., Ed. S., Ed.D., Ph.D.)
The Special Education program promotes the successful inclusion of individuals with disabilities and their families in society by educating teachers and leaders, generating new knowledge, and applying existing knowledge in real world settings. The Unified Elementary

ProTeach program leads to dual state certification as a special education and elementary classroom teacher for undergraduates who complete the five-year program with a M.Ed. degree in Special Education. The Teach Well program provides on-line, job-embedded instruction leading to M.Ed. and M.A.E. degrees. Advanced graduate degrees prepare professionals for leadership roles in schools, school districts, and higher education. Faculty and doctoral students engage in research and scholarly pursuits designed to enhance the lives of students with disabilities and their success within academic and social contexts.

EEX 5940: Supervised Student Teaching in Special Education(9) Intensive field experience while working with students with disabilities.
EEX 6053: Students with Disabilities: Advanced Study of Characteristics and Services (3) Advanced issues in identification of students with disabilities and delivery of services to meet their academic, developmental, and functional needs.
EEX 6072: Accessing Academic and Social Communities for Students with Disabilities(3) Information and expertise related to meeting effectively academic and social needs of full range of students in inclusive settings.
EEX 6125: Interventions for Language and Learning Disabilities (3) Language development and disorders and their impact on learning for students with (or at risk for) disabilities. Classroom-based intervention strategies for promoting language and literary development.
EEX 6219: Reading Assessment and Intervention for Students with Disabilities (3) The reading process and dyslexia; particularly the special educator's role in preventing and remediating reading disabilities.
EEX 6222: Evaluation in Special Education (3) *Prereq: or coreq: prior experience with exceptional students; introductory courses in measurement, statistics.* Issues and practices related to educational assessment of students with special needs.
EEX 6233: Assessment, Curriculum, and Instruction for Students with Mild Disabilities (3) *Prereq: admission to graduate status.* Providing educational services to students with mild disabilities.
EEX 6234: Assessment, Curriculum, and Instruction for Students with Severe Disabilities (3) *Prereq: unified elementary courses 4th year.* Providing educational services for students with severe disabilities.
EEX 6249: Advanced Strategies for Teaching Students with Disabilities (3) Designed to assist students in acquisition, proficiency, and application of best practices for teaching students with disabilities.
EEX 6661: Teaching and Managing Behavior for Student Learning (3) Practical strategies and techniques for teaching children and youths with behavioral problems.
EEX 6750: Families and Transition for Students with

Disabilities(3) Information and strategies for using family-centered approach to planning and implementing transitions for students with disabilities.

EEX 6786: Transdisciplinary and Transition Services in Special Education (3) *Prereq: EEX 6863.* Collaboration, transition planning, and professional development for serving children and youths with disabilities.

EEX 6835: Practicum in Special Education: Severe Disabilities (3) *Prereq: unified elementary courses 4th year.* Field-based experience in educational settings that serve students with severe disabilities.

EEX 6841: Practicum in Special Education: Mild Disabilities (3) Field-based experience in educational settings that serve students with mild disabilities.

EEX 6863: Supervised Practice in Special Education (12) *Prereq: approval of special education faculty in area of specialization and Office of Student Teaching.* Supervised teaching in selected school settings designed to serve children and youths who have been classified as having behavioral and/or learning problems. Seminars and continuous evaluation of teaching experiences. S/U.

EEX 6905: Individual Work (1-4; max: 12) *Prereq: consent of department chair, approval of proposed project, and completion of at least 9 hours of graduate work.*

EEX 6910: Supervised Research (1-5; max: 5) S/U.

EEX 6936: Special Topics (1-3; max: 12) *Prereq: consent of department chair.*

EEX 6940: Supervised Teaching (1-5; max: 5) S/U.

EEX 6971: Research for Master's Thesis (1-15) S/U.

EEX 6973: Project in Lieu of Thesis (1-9) Development, testing, and evaluation of original educational technology, curricular materials, or intervention program. S/U.

EEX 6XXX: Differentiated Instruction(3) *Prereq: graduate status or consent of instructor.* Provides teachers, administrators, and other professionals with information and expertise related to differentiating instruction to effectively meet the academic needs of the full range of students in their schools in inclusive settings.

EEX 7303: Inquiry in Special Education: Analysis of the Literature (3) *Prereq: EDF 6403.* Designed to assist in solidifying knowledge of research design acquired through course work in educational foundations by applying that knowledge to special education literature.

EEX 7304: Introduction to Field of Inquiry in Special Education(3) *Prereq: EDF 6403; coreq: EDF 6475.* Acquisition, organization, and interpretation of information about research. Nature of inquiry and process of generating questions about a broad array of disability-related research topics. Critical analysis of research outcomes.

EEX 7526: Grant Writing Seminar in Education (3) Developing basic skills in writing grant proposals for research, training, and/or model demonstration.

EEX 7787: School Improvement for All Students (3) *Prereq:*

advanced graduate status or consent of instructor. Seminar addressing research and professional literature on changing schools to improve academic and behavioral outcomes for all students.
EEX 7865: Internship: Special Education (1-12; max: 12)
EEX 7867: Teacher Education in Special Education (3) Preparation for teaching preservice teachers and practicing professionals. Effective teaching practices, collaborative models of teacher education, role of field experiences, and student advisement. Teacher education research literature reviewed and problems of conducting research with teachers and trainees discussed.
EEX 7934: Seminar: Trends in Special Education (3) *Prereq: admission limited to advanced degree students in special education.* Emphasis on trends in special education and future considerations for research, and local, state, and federal priorities.
EEX 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
EEX 7980: Research for Doctoral Dissertation (1-15) S/U.
EGI 6051: Education of the Gifted Child (3) Definitions of giftedness, characteristics of gifted children, and outside-of-school influences which affect achievement of gifted children.
EGI 6245: Program Development for the Gifted (3) School programs for the gifted. Educational provisions for the achieving and underachieving gifted individual.

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Speech Language and Hearing Sciences

College of Public Health and Health Professions

Graduate Faculty

Chair: C. M. Sapienza. *Graduate Coordinator:* B. P. Vinson.
Complete faculty listing by department: Follow this link

Graduate programs in the Department lead to Master of Arts and Doctor of Philosophy degrees in communication sciences and disorders and to the Doctor of Audiology degree. Requirements for these degrees are given in the *General Information* section of this catalog.

Major areas of emphasis include audiology, phonetic science, and speech-language pathology. Students, in conjunction with their supervisory committees, develop graduate programs to meet their specific needs and interests. Graduate specializations and programs in speech-language pathology and audiology are accredited by the Council on Academic Accreditation/American Speech-Language-Hearing Association.

The Department of Speech Language and Hearing Sciences, in conjunction with the Department of Communicative Disorders in the College of Health Professions, offers the Doctor of Audiology (Au.D.) degree. Graduate students take course work in both departments in theoretical and applied audiologic sciences and research.

Students must contact the graduate coordinator to obtain information about specific specialty requirements. The application deadline for fall admission is February 1. Entering master's students with deficiencies in the major area of study or with a bachelor's

degree in another field of study must fulfill basic prerequisites during the first year of graduate work. There are no specific undergraduate courses required for admission to the Au.D. degree program.

ASL 5406: Manual Communication with the Hearing Impaired (1; max: 3) Overview of signing systems, including ASL, Signed English, and Signing Exact English. Emphasis on signing skills most useful to audiologist.
LAE 6505: Applied Preschool Language Disorders: Diagnosis and Treatment(3) Seminar and practicum in diagnoses and treatment of preschool children with language learning disabilities.
SPA 5051: Clinical Observation in Audiology (1) *Prereq: for beginning graduate students in audiology.* Opportunity to observe various phases of audiologic practice and to accumulate a minimum of 15 hours of observation experience.
SPA 5102: Auditory Anatomy and Physiology (2) In-depth coverage of anatomy and physiology of auditory system to support understanding of auditory function in persons with healthy auditory mechanisms and those with specific disorders.
SPA 5128: Speech Perception (2) Understanding speech perception in hearing-impaired and/or aged listeners. Auditory and cognitive hypotheses to explain speech-recognition deficits; and clinical and theoretical intervention strategies to alleviate perceptual deficits in these populations.
SPA 5204: Phonological Disorders (3) Advanced principles of diagnosis and remediation.
SPA 5211: Voice Disorders (3) Advanced theory and techniques of diagnosis and remediation.
SPA 5225: Principles of Speech Pathology: Stuttering (3) Advanced theories and techniques of diagnosis and therapy.
SPA 5245: Communicative Disorders Related to Cleft Palate (3) *Prereq: SPA 5204, 5211, 5403.* Lectures and laboratory study of the "team approach" and interdisciplinary aspects of communicative disorders in the cleft palate individual.
SPA 5254: Neurocognitive Language Disorders (2) *Prereq: introductory neuroanatomy.* Neurocognitive deficits of language in dementia, traumatic brain injury, and right hemisphere damage.
SPA 5304: Principles of Audiological Evaluation (3) Advanced procedures in speech audiometry, masking, and audiogram interpretation.
SPA 5315: Peripheral and Central Auditory Disorders (2) Understanding (1) anatomy and physiology of peripheral and central auditory mechanism, (2) etiology and pathology of peripheral and central hearing loss, and (3) audiological and otologic diagnosis/treatment of hearing loss.
SPA 5401: Speech Pathology Language Disorder (3) Advanced theory and techniques of diagnosis and remediation of language disorders in infants and preschoolers.
SPA 5405: Language Disorders II (3) Detailed examination of language intervention programs and nonvocal communication

systems.

SPA 5553: Instrumentation and Diagnosis in Speech-Language Pathology (2) Hands-on experience using instrumentation in diagnosis.

SPA 5563: Psychosocial Aspects of Hearing Loss (2) Psychological implications of hearing impairment. Specifically psychoeducational/psychosocial and counseling strategies and rehabilitation procedures for patient and family management.

SPA 5646: Speech and Language of the Deaf and Hard of Hearing (2) Advanced principles and procedures in the assessment and development of speech and language in individuals with hearing loss.

SPA 6008: Medical Aspects of Speech-Language Pathology (1) *Prereq: SPA 7946.* Overview of the speech pathologist's role in the medical environment. S/U.

SPA 6010: Basic Auditory Sciences (3) The nature of sound, the structure and function of the auditory system, frequency selectivity, auditory filtering, and the psychoacoustics of pure tones and complex sounds.

SPA 6117: Science of Singing (3) Intended for voice or CSD majors with interest in singing voice, its production, and its maintenance as instrument of health and beauty. Introduction to anatomy and physiology of speech mechanism and acoustics of voice production.

SPA 6133L: Hearing Aid Analysis Laboratory (1) *Coreq: SPA 6345.* Advanced analysis and description of the electroacoustical properties of hearing aids.

SPA 6207: Applied Phonological Disorders: Diagnosis and Treatment (3) *Prereq: majors only.* Seminar and practicum.

SPA 6211: Applied Voice Disorders: Diagnosis and Treatment (3) *Prereq: majors only.* Seminar and practicum.

SPA 6217: Vocal Health and Habilitation (3) Production of normal voice. Identifying and managing vocal problems specific to the singer or performer.

SPA 6229: Applied Fluency Disorders: Diagnosis and Treatment (3) *Prereq: majors only.* Seminar and practicum.

SPA 6233: Speech Motor Control Disorders (3) Developmental and acquired neurogenic speech disorders and their associated neuropathology, etiology, characteristics, assessment practices, and treatment strategies.

SPA 6270: Auditory Processing Disorders (3) *Prereq: SPA 5304, 5102.* Anatomy and physiology of the central auditory nervous system, and disorders of auditory processing that occur in humans. Focuses on evaluation and treatment of auditory processing disorders.

SPA 6300: Introduction to Graduate Research (3) *Prereq: required of all graduate students specializing in speech-language pathology or audiology.*

SPA 6305: Pediatric Audiology (3) *Prereq: SPA 6313.*

SPA 6311: Medical Audiology (2) Differential diagnosis of hearing impairment.

SPA 6312: Advanced Audiology and Neuro-Otology (2) *Prereq: SPA 6311.* Medical description, case presentation, and management of hearing loss.
SPA 6317: Vestibular Disorders (2) *Prereq: graduate status.* Mechanics and physiology of human balance, contribution of inner ear to balance, disorders of balance, and approaches to diagnostic assessment and rehabilitation.
SPA 6323: Audiologic Rehabilitation for Adults (2) Explores theoretical and clinical literature. Describes assessment and management strategies.
SPA 6324: Audiologic Rehabilitation for Children (2) Explores theoretical and clinical literature. Assessment and therapy techniques for children.
SPA 6340: Amplification I (2) Theoretical and applied understanding of current technology in amplification systems for the hearing impaired. Seminar format (2/3) and clinical laboratory activities (1/3).
SPA 6341: Amplification II (2) *Prereq: SPA 6340.* Digital and programmable technology in hearing aids.
SPA 6342: Amplification III (2) Theoretical and applied understanding of current and future technology in amplification systems. Recent advances in programmable and digital hearing aids. Hearing aid selection procedures for special populations. Assistive learning devices. Classroom amplification systems.
SPA 6410: Adult Language Disorders (3) The nature of acquired aphasia and related disorders. Applying neurolinguistic and neuropsychological models to methods of assessment and treatment.
SPA 6416: Applied Neurogenic Disorders: Diagnosis and Treatment (3) *Prereq: majors only.* Seminar and practicum.
SPA 6430: Applied Developmental Disorders: Diagnosis and Treatment in Speech and Language (3) *Prereq: majors only.* Seminar and practicum.
SPA 6436: Issues in Autism Spectrum Disorders (3) Review of related issues including diagnosis, intervention, and current research.
SPA 6506: Clinical Clerkship in Audiology (1; max: 3) Beginning-level audiologic practicum.
SPA 6507: Applied Augmentative and Alternative Communication (3) Introduction to clinical experience through planning, conducting, and writing up diagnostic and therapy sessions with individuals who have little or no functional speech and or writing.
SPA 6521: Practicum in Speech-Language Diagnostics: UFSHC (1-6; max: 6) *Prereq: SPA 5553.*
SPA 6524: Practicum in Speech-Language Therapy: UFSHC (1-6; max: 6)
SPA 6531: Clinical Practice in Hearing Assessment (1-6; max: 6)
SPA 6533: Clinical Practice in Aural Rehabilitation (1-6; max: 6)

SPA 6559: Alternative and Augmentative Communication (2) *Prereq: SPA 5403, 5405.* Survey of issues and research into the use of unaided and aided augmentative and alternative communication methods by persons with deficits in speech and writing.
SPA 6564: Communication and Aging (3) Characteristics of, and management approaches for, communication disorders found with some frequency in the elderly. Focues on enhancing communication.
SPA 6565: Seminar in Dysphagia (3) Anatomy, physiology, and neurology of normal swallow. Review of further diagnostic procedures and treatment protocols.
SPA 6568: Clinical Evaluation in Medical Speech-Language Pathology (3) *Prereq: SPA 6008.* Framework for evaluating communication and swallowing skills of patients at all levels of care across many types of disorders.
SPA 6570: Seminar: Professional Aspects of Speech-Language Pathology (3) Administration of speech-language pathology services in varied settings (hospitals, schools, community clinics, private practice, universities) studied from educational, legal, business, and ethical perspectives.
SPA 6581: Special Clinical (1-9; max: 12) Advanced study in specific areas of clinical process.
SPA 6830: Communication Disorders in Medically Complex Pediatric Populations (3) *Prereq: SPA 6008.* Clinical research.
SPA 6905: Individual Study (1-3; max: 9) *Prereq: consent of instructor.* Supervised study of specialized topic or research project.
SPA 6910: Supervised Research (1-5; max: 5) *Prereq: SPA 6300, and consent of instructor.* S/U.
SPA 6930: Proseminar in Speech-Language Pathology and Audiology (1; max: 6) Faculty and graduate student research in speech-language pathology, audiology, and related disciplines. S/U.
SPA 6935: Applied Reading Disabilities: Diagnosis and Treatment (3) *Prereq: majors only.* Seminar and practicum in diagnosis and treatment of developmental reading disabilities.
SPA 6936: Special Topics (3; max: 9) *Prereq: consent of instructor.* Theory and research in communication.
SPA 6940: Supervised Teaching (1-5; max: 5) S/U.
SPA 6942: Externship in Speech-Language Pathology (7-12; max: 12) Full-time supervised clinical experience in speech-language pathology. Students provide diagnostic and therapeutic services in clinical setting.
SPA 6971: Research for Master's Thesis (1-15) S/U.
SPA 7132C: Clinical Instrumentation for Evaluating Upper Aerodigestive Tract Functions (3; max: 3) Introduction to instrumentation used in clinical evaluation and treatment and clinical research. Experiential component.
SPA 7306: Audiologic Assessment in a Medical Setting (5) *Prereq: open only to students in the distance learning Au.D. program.* Audiologic and medically related aspects of hearing disorders.
SPA 7318: Clinical Auditory Electrophysiology (5) *Prereq: open only to students in the distance learning Au.D. program.*

Understanding clinical auditory physiological measures, including auditory-evoked and event-related potentials, otoacoustic emissions, and common clinical protocols applied to auditory disorders.

SPA 7319: Balance Disorders: Evaluation and Treatment (5) *Prereq: open only to students in the distance learning Au.D. program.* Understanding how humans maintain balance, the contribution of the inner ear to balance, disorders of balance, and approaches to rehabilitation of these disorders.

SPA 7325: Audiologic Rehabilitation (5) *Prereq: open to students in the distance learning Au.D. program.* State-of-the-art information on current philosophies and practice patterns for audiologic habilitation and rehabilitation.

SPA 7348: Principles of Amplification (5) *Prereq: open only to students in the distance learning Au.D. program.* Recent information regarding amplification systems.

SPA 7353: Environmental Hearing Conservation (5) *Prereq: open only to students in the distance learning Au.D. program.* Recent information regarding the causes of hearing loss, prevention strategies, and basic mechanisms underlying noise-induced hearing loss.

SPA 7354: Seminar in Audiology: Hearing Conservation and Noise Control (3)

SPA 7391: Business and Professional Issues in Audiology (5) *Prereq: open only to students in the distance learning Au.D. program.* Overview of the healthcare system, the place of audiology in the system, current issues facing the profession, ethics of audiologic practice, providing reimbursement for services, and personnel management.

SPA 7415: Neurolinguistics of Adult Language Disorders (3) *Prereq: SPA 6410, LIN 6932, or consent of the instructor.* Psycho- and neurolinguistic research on acquired language disorders. Theoretical models of language representation and implications for treatment.

SPA 7500: Public School Practicum (1-3; max: 10) *Prereq: majority of preprofessional courses.* Experience in partial fulfillment of department's clinical requirements.

SPA 7523: Practicum in Speech Pathology in a Medical/Dental Setting (1-6; max: 6) *Prereq: SPA 6521, 6524, and consent of department.*

SPA 7540: Diagnosis and Treatment of Language and Language-Based Literacy Disorders (3) *Prereq: graduate-level reading course.* Clinical aspects of intervention for children and adults who have language disabilities, focusing on identification, diagnosis, and treatment of emergent literacy and language disorders.

SPA 7566: Counseling Individuals with Hearing Losses (5) *Prereq: open only to students in the distance learning Au.D. program.* Recent information about counseling.

SPA 7821: Supervised Clinical Research (1-12; max: 12) Advanced clinical research topics in speech-language pathology and audiology. S/U.

SPA 7833: Audiology Research Project (3-6; max: 6) S/U.
SPA 7937: Seminar in Advanced Studies of Language and Literacy Development and Disabilities (3) *Prereq: consent of instructor.* Contemporary theories, research, and clinical applications in the areas of language and literacy for typical and atypical learners.
SPA 7945: Graduate Practicum in Audiology (3-6; max: 15) Intermediate clinical practicum for Au.D. students.
SPA 7946: Clinical I: Practicum in Medical Speech and Language Pathology (1-10; max: 10) *Prereq: minimum 50 clock hours of graduate clinical practicum.*
SPA 7947: Clinical II: Practicum in Advanced Medical Speech-Language Pathology (1-10; max: 10) *Prereq: minimum 5 hours of SPA 7946 or equivalent.*
SPA 7958: Clinical Externship (3-12; max: 36) *Prereq: 12 hours of SPA 7945.*
SPA 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
SPA 7980: Research for Doctoral Dissertation (1-15) S/U.

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Statistics

College of Liberal Arts and Sciences

Graduate Faculty

Chair: M. J. Daniels. *Graduate Coordinator:* J. P. Hobert. *Complete faculty listing by department*: Follow this link

Graduate programs are available leading to Master of Science in Statistics, Master of Statistics, and Doctor of Philosophy degrees. Minimum requirements for these degrees are described in the *General Information* section of this catalog.

Both master's programs usually require 2 years of course work including material covered in STA 6207, 6208, 6326, 6327, 6246, and 6329. In addition to earning a "Ph.D. pass" on the first-year evaluation, requirements for the Ph.D. degree include STA 6466, 6467, 7249, and 7346.

Interdisciplinary programs: The Department offers a co-major program in conjunction with the Fisher School of Accounting leading to the Doctor of Philosophy degree in statistics and business administration accounting. The Department is also a partner in the interdisciplinary concentration in quantitative finance, along with the Departments of Mathematics; Industrial and Systems Engineering; and Finance, Insurance, and Real Estate. For information on these programs, consult the departmental graduate coordinator.

Combined program: The Department offers a bachelor's/master's degree program. Contact the graduate coordinator for information.

STA 5106: Computer Programs in Statistical Analysis (1)

Prereq: STA 6166. Using library computer programs to analyze balanced experimental data and for regression analysis.

STA 5223: Applied Sample Survey Methods (3) *Prereq: STA 2023, 4322, 6126, or 6166.* Designing and analyzing sample surveys. Sources of error. Questionnaire design. Simple random, stratified, systematic, and cluster sampling. Practical application of concepts.

STA 5325: Fundamentals of Probability(3) *Prereq: grade of C or better in MAC 2313 and STA 3032 or equivalent.* Topics in probability and statistics, particularly discrete and continuous random variables, sampling distributions, estimation, and hypothesis testing. Applications to engineering and natural science.

STA 5328: Fundamentals of Statistical Theory (3) *Prereq: STA 4321 or equivalent.* Direct continuation of STA 4321/STA 5325. Basic material for distribution theory, sampling distributions, properties of estimators, hypothesis testing, linear regression analysis, and analysis of variance. A good knowledge of calculus is helpful.

STA 5503: Categorical Data Methods (3) *Prereq: STA 3024, 3032, 4210, 4322, 6127, or 6167. Intended for graduate students not majoring in statistics.* Description and inference using proportions and odds ratios, multi-way contingency tables, logistic regression and other generalized linear models, and loglinear models applications.

STA 5507: Applied Nonparametric Methods (3) *Prereq: STA 2023, 3032, 4210, 4322, 6126, 6166. Intended for graduate students not majoring in statistics.* Introduction to nonparametric statistics. Includes one- and two-sample testing and estimation methods, one- and two-way layout models, and correlation and regression models.

STA 5701: Applied Multivariate Methods (3) *Prereq: STA 3024, 6127, 6167, or 4211. Intended for graduate students not majoring in statistics.* Review of matrix theory, univariate normal, t, chi-squared and F distributions, and multivariate normal distributions. Inference about multivariate means, Hotelling's T^2 multivariate analysis of variance, multivariate regression, and multivariate repeated measures. Inference about covariance structure, principal components, factor analysis, and canonical correlation. Multivariate classification techniques, discriminant and cluster analysis. Additional topics at the discretion of the instructor, time permitting.

STA 5715: Applied Survival Analysis (3) *Prereq: STA 6127 or 6167.* Survival analysis data methods, including Kaplan-Meier and Nelson estimators of survival, accelerated failure, proportional hazards models, and frailty and recurrent-event models.

STA 5823: Stochastic Process Methods (3) *Prereq: STA 4321 or 5325.* Mathematical foundations of elementary stochastic processes, including Poisson processes and Markov chains, branching, and renewal processes.

STA 5856: Applied Time Series Methods (3) *Coreq: STA 4322 or STA 5328.* Stationarity, autocorrelation, ARMA models, non-stationary processes, ARIMA models, regression with ARMA errors,

model-based forecasting, forecasting algorithms.

STA 6092: Applied Statistical Practice (3) *Prereq: STA 6207, 6208.* Communication, management, and the organizational, computational, and statistical thinking skills needed for consulting in statistics. Integrating graphic and numeric computing tools, research design concepts, data summary, and statistical inference methods.

STA 6126: Statistical Methods in Social Research I (3) Descriptive statistics, estimation, significance tests, two-sample comparisons, methods for nominal and ordinal data, regression and correlation, introduction to multiple regression.

STA 6127: Statistical Methods in Social Research II (3) *Prereq: STA 6126.* Further topics in multiple regression, model building, analysis of variance, analysis of covariance, multivariate analysis of categorical data.

STA 6166: Statistical Methods in Research I (3) *Prereq: STA 2023 or equivalent.* Statistical methods based on t, F, and Chi^2 tests. Analysis of variance for basic experimental designs. Factorial experiments. Regression analysis and analysis of covariance.

STA 6167: Statistical Methods in Research II (3) *Prereq: STA 6166.* Analysis of covariance and general linear model. Factorial, nested, split-plot, and incomplete block designs. Analysis of count data.

STA 6176: Introduction to Biostatistics (3) *Prereq: STA 6207, 6326.* Analyzing epidemiological studies. Measures of morbidity and mortality. Methods for rates and proportions, bioassay, and longitudinal data analysis.

STA 6178: Genetic Data Analysis (3) *Prereq: STA 6327.* Biological and molecular basis. Likelihood ratio test, multinomial distribution and Bailey's theorem. Linkage analysis of qualitative traits. Twin and sibling studies. Computing the kinship coefficient by the matrix method. Mapping quantitative trait loci by EM algorithm. Heritability. Breeding value prediction using flanking markers with variance component analysis. Linkage disequilibrium analysis for gene mapping. Forensic genetics using Bayes' formula. Genetic counseling. Gene pattern matching and constructing evolutionary trees by cluster analysis.

STA 6207: Basic Design and Analysis of Experiments (3) *Prereq: STA 6208 Regression Analysis.* Principles of experimental design, completely randomized design (analysis, contrasts, diagnostics), random effects models, factorial experiments (fixed, random, and mixed effect), block designs, Latin squares, split plots, and full and fractional factorial experiments.

STA 6209: Design and Analysis of Experiments (3) *Prereq: STA 6207.* Tests of assumptions; block designs; control of two-way heterogeneity; cross over designs; factorial experiments; fractional factorials; analysis of "messy" data.

STA 6226: Sampling Theory and Application (3) *Prereq: STA 6327 or consent of instructor.* Theory and application of commonly used sampling techniques; simple random sample, cluster, ratio, regression, stratified, multistage, and systematic samples. Special

topics include wildlife surveys, non-sampling error adjustment, categorical data analysis, and practical survey examples.

STA 6246: Theory of Linear Models (3) *Prereq: STA 6208, 6327, 6329.* Theory for analysis of linear models in univariate data; distributions of quadratic forms; full rank linear models; fixed effect models of less than full rank; balanced random and mixed models; unbalanced random and mixed models.

STA 6326: Introduction to Theoretical Statistics I (3) *Prereq: MAC 2313.* Theory of probability. Probability spaces, continuous and discrete distributions, functions of random variables, multivariate distributions, expectation, conditional expectation, central limit theorem, useful convergence results, sampling distributions, distributions of order statistics, empirical distribution function.

STA 6327: Introduction to Theoretical Statistics II (3) *Prereq: STA 6326.* Estimation and hypothesis testing. Sufficiency, information, estimation, maximum likelihood, confidence intervals, uniformly most powerful tests, likelihood ratio tests, sequential testing, univariate normal inference, decision theory, analysis of categorical data.

STA 6329: Matrix Algebra and Statistical Computing(3) *Prereq: MAC 3313.* Basic theory of determinants, inverses and generalized inverses, eigenvalues and eigenvectors; applications of partitioned matrices; diagonalization and decomposition theorems; applications in least squares.

STA 6505: Analysis of Categorical Data (3) *Prereq: STA 6327 and 6207 or consent of instructor.* Varieties of categorical data, cross-classification tables, tests for independence. Measures of association. Loglinear models for multi-dimensional tables. Logit models and analogies with regression. Specialized methods for ordinal data.

STA 6526: Nonparametric Statistics (3) *Prereq: STA 6327 or consent of instructor.* Inference based on rank statistics. One, two, and k-sample problems. Correlation and regression problems. Analysis of contingency tables. Conditionally distribution-free rank tests. Pitman asymptotic relative efficiency.

STA 6707: Analysis of Multivariate Data (3) *Prereq: STA 6208 and facility in a computer language.* Techniques for analyzing multivariate data. Emphasis on MANOVA and tests on the structure of the dispersion matrix. Topics will include discriminant, factor, profile, and cluster analyses.

STA 6826: Stochastic Processes (3) *Prereq: STA 6327.* Discrete time and state Markov process. Ergodic theory.

STA 6857: Time Series Analysis (3) *Prereq: STA 4322 and a basic computer language.* Linear time series model building, spectral density estimation, analysis of nonstationary data, SAS package on Box and Jenkins model building and forecasting. Case studies in recent literature will be discussed.

STA 6866: Monte Carlo Statistical Methods (3) *Prereq: STA 6327 and STA 6208, or consent of instructor.* Introduction to Monte Carlo statistics.

STA 6905: Individual Work (1-4; max: 10) *Prereq: departmental*

approval. Special topics designed to meet the needs and interests of individual students.

STA 6910: Supervised Research (1-5; max: 5) S/U.

STA 6934: Special Topics in Statistics (1-3; max: 12) *Prereq: permission of graduate adviser.*

STA 6938: Seminar (1; max: 15) *Prereq: departmental approval.* Special topics of an advanced nature suitable for seminar treatment but not given in regular courses. S/U.

STA 6940: Supervised Teaching (1-5; max: 5) S/U.

STA 6942: Internship (1-3; max: 3) *Prereq: STA 6208 or equivalent and consent of graduate coordinator.* Supervised statistical consulting involving planning and/or analyzing research data. Whenever possible, student meets with researcher. Supervision by faculty member or delegated authority and post-internship report. S/U.

STA 6971: Research for Master's Thesis (1-15) S/U.

STA 7179: Survival Analysis (3) *Prereq: STA 6177.* Theoretical introduction to statistical inferential procedures useful for analyzing randomly right censored failure time data.

STA 7249: Generalized Linear Models (3) *Prereq: STA 6207, 6208, 6327, 6246.* Fitting of generalized linear models, diagnostics, asymptotic theory, overdispersion, estimating equations, mixed models, generalized additive models, smoothing.

STA 7334: Limit Theory (3) *Prereq: STA 6467.* Review of different models of convergence. Cramer-Wold device. Multivariate CLT. Asymptotic theory of empirical distribution and sample quantiles. Bahadur's representation. Asymptotic theory of sample moments. Delta method and its multiparameter generalization. Variance stabilizing transformation. U-statistics: asymptotic theory and its statistical applications. Hoeffding's decomposition. Asymptotic theory of maximum likelihood estimation. Wald's consistency theorem for MLE. Asymptotic normality and efficiency. Asymptotic theory of GLRTs. Statistical applications: asymptotic theory of categorical data, linear models, and generalized linear models.

STA 7346: Statistical Inference (3) *Prereq: STA 6327.* Decision rules and risk functions. Sufficiency, Minimax, and Bayes rules for estimating location and scale parameters.

STA 7347: Advanced Inference (3) *Prereq: STA 7346.* Bayesian statistical inference. Inference using large samples. Relative efficiencies of tests and estimates with special reference to Pitman and Bahadur efficiencies.

STA 7348: Bayesian Theory(3) *Prereq: STA 7346* Theory underlying the Bayesian paradigm. Issues related to selection of priors; Bayesian interference, both exact and asymptotic; Bayesian model selection; high-dimensional problems; and Bayesian robustness.

STA 7466: Probability Theory I (3) *Prereq: MAA 5228, 6236, or equivalent.* Measure and probability spaces. Random variables. Distribution functions. Abstract Lebesgue and Stieltjes integration. Monotone. Dominated, Cauchy, and mean convergence. Fubini and Radon-Nikodym theorems. Zero-one laws.

STA 7467: Probability Theory II (3) *Prereq: STA 7466.* Summability of independent random variables. Laws of large numbers. Convergence in distribution. Characteristic functions. Uniqueness and continuity theorems. The Lindeberg-Feller central limit theorem. Degenerate convergence criterion.

STA 7526: Theory of Nonparametric Statistics (3) *Prereq: STA 6526 or consent of instructor.* Theoretical foundations of nonparametric statistics: theory of U-statistics, normed based methods, linear rank and signed rank statistics; Pitman efficiency; point estimation, interval estimation and tests of hypotheses; theory of robustness and its application to one sample, two sample and linear model settings; extensions to multivariate problem settings; contemporary topics in nonparametric inference.

STA 7828: Topics in Stochastic Processes(3) *Prereq: STA 6466 and STA 6467.* Branching processes, Brownian motion, continuous state space Markov chains, diffusion processes, Markov chain Monte Carlo, martingales, point processes, renewal processes, stationary processes, stochastic calculus, stochastic differential equations.

STA 7934: Special Topics in Statistics (1-9; max: 15) *Prereq: Permission of Graduate Coordinator.* Possible Topics: Smoothing Methods, Analysis of Longitudinal Data, Data Mining and Statistical Learning, Mixed Models, Theory and Methods, Resampling Methods, Functional Data Analysis.

STA 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

STA 7980: Research for Doctoral Dissertation (1-15) S/U.

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Taxation

Fredric G. Levin College of Law

Graduate Faculty

Chair and Graduate Coordinator: M. K. Friel. *Complete faculty listing by department*: Follow this link

Graduate study in the field of taxation leading to the Master of Laws in Taxation degree or to the Master of Laws in International Tax degree is available in the College of Law.
Applicants for admission to the Graduate School for these degrees must hold a law degree from an accredited law school or in the case of international students, from a recognized foreign university but need not submit scores on the Graduate Record Examination. For further information concerning admission consult the *Graduate Tax Program Catalog*, or write the Tax Office, 320 Holland Law Center.

LAW 7602: Taxation of Property Transactions (3) Tax problems of individual taxpayers. Problems incident to the sale, exchange, and other disposition of property, including recognition and characterization concepts.
LAW 7604: Timing Issues in Taxation (2) Aspects of federal income tax dealing with timing issues in income taxation, including tax accounting methods, transactional versus annual reporting, tax problems arising out of time value of money principles, and problems in the reporting of error corrections in taxation.
LAW 7611: Corporate Taxation I (3) Tax considerations in corporate formations, distributions, redemptions, and liquidations, including Subchapter C and Subchapter S corporations. Consideration of alternatives relating to the sales of corporate

businesses.

LAW 7613: Corporate Taxation II (2-3; max: 3) *Prereq: LAW 7601 or consent of instructor.* Corporate reorganizations; corporate acquisitions and divisions, including transfer or inheritance of losses and other tax attributes; corporate penalty taxes; provisions for consolidated returns.

LAW 7614: U.S. International Tax I (2-3; max: 3) Tax definition of resident. Distinction between domestic and foreign entities. Taxation of business and nonbusiness income of foreign persons. Taxation of income from trades or businesses carried on by foreign persons in the U.S. Special rules on U.S. real property interests. Branch profits and branch interest taxes.

LAW 7615: U.S. International Tax II (2) The foreign tax credit; special rules on controlled foreign corporations; foreign currencies; and cross-border transfers in nonrecognition transactions.

LAW 7617: Partnership Taxation (3) Tax meaning of "partnership"; formation transactions between partner and partnership, determination and treatment of partnership income; sales or exchange of partnership interest; distributions; retirement; death of a partner, drafting the partnership agreement.

LAW 7623: Taxation of Gratuitous Transfers (2 or 3 at option of department) Federal estate, gift, and generation-skipping transfer taxes.

LAW 7625: Income Taxation of Trusts and Estates (2) Taxation of income of trusts and estates, including simple and complex trsuts, annuities, property distributions, income in respect of decedent, grantor trusts.

LAW 7626: Estate Planning (2) Planning lifetime and testamentary private dispositions of property, postmortem planning; analysis of small and large estates; eliminating and offsetting complicating and adverse factors; selection of fiduciary and administrative provision.

LAW 7632: Deferred Compensation (2) Tax consequences of compensation in forms other than cash paid contemporaneously with performance of services, including nonqualified deferral compensation devices, and qualified pension and profit-sharing plans.

LAW 7633: Tax Exempt Organizations (2) Study of exemption from federal income tax accorded to a variety of public and private organizations, and tax treatment of contributions to such organizations; public policies underlying exemption from tax and deductibility of contributions.

LAW 7640: Civil Tax Procedure (2) Legal and procedural aspects of federal tax administration, collection and litigation.

LAW 7641: Procedures in Tax Fraud Cases (2) Criminal offenses and methods of proof; investigative authority of the IRS; summons enforcement proceedings; search warrants and grand jury subpoenas; constitutional defenses to the compulsory production of evidence; the attorney-client privilege and other objections available to taxpayers and third parties.

LAW 7650: State and Local Taxation (2) Nature and purpose of

state taxation, comparison of property and excise taxes; uniformity of taxation; assessment and collection procedures; remedies available to taxpayers.

LAW 7660: Tax Policy(2) Examines the principal criteria used in choosing forms of taxation. The impact of tax provisions on type and location of business and investment activities. Content may vary.

LAW 7680: Comparative Taxation(2) A comparative study of tax systems of the world, including income and wealth transfer taxes and taxes on consumption. Basic structural features and policies.

LAW 7681: Consumption Taxation(2) Value-added taxes of various countries and other types of consumption taxes; personal consumption taxes and flat tax.

LAW 7682: Income Tax Treaties(2) Bilateral income tax conventions between countries to alleviate double taxation of income from international investments and activities and to provide for exchanges of tax information and consultation between tax authorities.

LAW 7683: Transfer Pricing(2) International transactions between related entities in connection with tax requirement that such transactions be priced as if between unrelated persons.

LAW 7905: Independent Study (1-3; max: 4) S/U.

LAW 7910: Supervised Research (1-5; max: 5) S/U.

LAW 7911: Federal Tax Research (1-2; max: 2) Substantial research and writing project on a federal tax subject; instruction in tax research techniques.

LAW 7931: Current Federal Tax Problems (1-2; max: 6) Significant current developments in tax law, often with emphasis on policy considerations. Variable content.

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Teaching and Learning

College of Education

Graduate Faculty

Director: E. Bondy. *Graduate Coordinator:* S. G. Terzian.
Complete faculty listing by department: Follow this link

The School of Teaching and Learning (http://education.ufl.edu/school) offers online and face-to-face programs leading to the Master of Education (M.Ed., non-thesis), Master of Arts in Education (M.A.E., thesis or project in lieu of thesis), Specialist in Education (Ed.S.), Doctor of Education (Ed.D.), and Doctor of Philosophy (Ph.D.) degrees in curriculum and instruction. Complete descriptions of the requirements for these degrees are provided in the General Information section of this catalog.

The School offers graduate study and research experience in 10 areas of specialization: curriculum, teaching, and teacher education; educational technology; elementary education; mathematics education; language and literacy education (including children's literature, English education, ESOL/bilingual education, language arts, and reading education); science and environmental education; social foundations of education; social studies education; and teacher leadership for school improvement.

The nationally recognized Proteach graduate program leads to the M.Ed. degree and state certification as a classroom teacher. Unified Elementary ProTeach admits undergraduates who complete the five-year program with a master's degree. Secondary Proteach (English, Science, Social Studies) prepares teachers who have completed a

bachelor's degree in the discipline they will teach. Prospective elementary teachers who already hold a bachelor's degree in a non-education field may want to consider the School's SITE program (Site-based Implementation of Teacher Education), which leads to the M.Ed. degree in curriculum and instruction. Students may apply to the state for alternative certification.

Beyond the Graduate School and College of Education admission requirements, students should have academic preparation and teaching experience appropriate to the program being pursued. Students having deficiencies in their preparation will be required to follow a program to remove such deficiencies. A limited amount of support is available for graduate studies through fellowships, scholarships, research assistantships, and teaching assistantships.

EDG 6207: Transforming the Curriculum(3) *Prereq: EDE 6325.* Design more rigorous and engaging curriculum leading to increased student understanding and mastery of subject matter. Examine different ways of assessment.
EDG 6415: Culturally Responsive Classroom Management (3) Examines the role culture plays in teaching and learning. Explores what is needed to establish a culturally responsive classroom in which all students can succeed.
EDG 6953: TLSI Online Portfolio Preparation (1-3; max: 3) *Prereq: EDE 6325.* Development of portfolio artifacts. Preparation for defense of program portfolio.
EDG 6xxx: Global Studies Methods in K-12 Education (3) Overview of current issues and strategies for incorporating them into the K-12 curriculum. Intended for non-education majors.
EME 6606: Advanced Instructional Design(3) *Prereq: EME 6609.* Focuses on the student who is becoming an instructional design (ID) Professional by refining skills and adding to the skills learned in the beginning Instructional Design course, building on the foundational knowledge about the practice of ID, and encouraging the development of communication skills through formal project management.
EME 6609: Instructional Design (3) Focuses on the application of instructional design principles to the development of instruction. Topics include contemporary issues and trends in instructional design, foundations in learning research, requirements for instruction, task and needs analysis, learning situations and instructional models, learner characteristics, hardware and software innovations, assessing instructional outcomes, and factors affecting utilization.
LAE 6348: Teaching Multiliteracies (3) Application of theory and methods in teaching multiple modes of literacy.
LAE 6865: Teaching Media Literacy with the Internet (3) Application of literacy theory and pedagogy to teaching multimodal internet texts.
MAE 6313: Problem Solving in School Mathematics (3) Analyzes problem solving as an underlying theme in elementary mathematics

for preservice teachers. Emphasizes development of pedagogical content knowledge in elementary school mathematics.
SCE 6647: Global Studies Methods in Science Education (3) Research and best practices for incorporating global studies into the K-college science curriculum.

Curriculum and Instruction

EDE 6325: Teacher Inquiry/Action Research (3) *Prereq: EDE 6948.* Purpose, goals, and processes of teacher inquiry and application of this methodology in the classroom.
EDE 7047: Issues in Teacher Education(3; max: 9) Current issues and theory in teacher education and teacher education reform.
EDG 6047: Teacher Leadership for Educational Change (3) Understanding teachers' roles in the educational change and improvement process.
EDG 6207: Transforming the Curriculum(3) *Prereq: EDE 6325.* Design more rigorous and engaging curriculum leading to increased student understanding and mastery of subject matter. Examine different ways of assessment.
EDG 6356: Teaching, Learning and Assessment (3) Historical and in-depth exploration of assessment practices related to curricular issues.
EDG 6905: Individual Work (1-6; max: 12 including EDA 6905) *Prereq: student must have approval of proposed project before registering.* For advanced students who wish to study individual problems under faculty guidance.
EDG 6910: Supervised Research (1-5; max: 5) S/U.
EDG 6931: Special Topics (1-4; max: 12 including EDA 6905) *Prereq: consent of instructor.*
EDG 6940: Supervised Teaching (2; max: 10) *Prereq: adviser's consent.* For graduate students serving as teaching assistants under the supervision of a faculty member. S/U.
EDG 6971: Research for Master's Thesis (1-15) S/U.
EDG 6973: Project in Lieu of Thesis (1-9) Developing, testing, and evaluating original educational technology, curricular materials, or an intervention program. S/U.
EDG 7224: Critical Pedagogy (3) Core concepts and practice of critical educational theory.
EDG 7252: Perspectives in Curriculum, Teaching, and Teacher Education(3) Issues related to curriculum, teaching, and teacher education.
EDG 7303: Teacher Learning and Socialization in High Poverty Schools (3) Explores theory and research related to teacher learning, focusing on high-poverty schools.
EDG 7326: Differentiated Supervision and Teacher Professional Development (3) Study of teacher professional development and supervision at both the theoretical and practical levels.
EDG 7941: Field Experience in Curriculum and Instruction (1-

4; max: 10) *Prereq: open only to advanced graduate students.* Supervised experiences appropriate to the student's professional goals.
EDG 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
EDG 7980: Research for Doctoral Dissertation (1-15) S/U.
EDM 6005: The Emergent Middle School (3) Program, organization, and rationale of the newly emerging middle school in American school districts.
EDM 6235: Interdisciplinary Planning, Teaching, and Assessment (3) Interdisciplinary team organization, integrated curriculum, team planning, collaboration consultation, and strategies for assessment.

Educational Technology

EME 5054: Foundations of Educational Technology(3) *Prereq: consent of instructor.* History, foundations, and literature in educational technology.
EME 5207: Designing Technology-Rich Curricula (3) Extensive work in curriculum development utilizing instructional technologies. Contrasting views of curriculum development.
EME 5315: Communicating with Technology (3) Explores the communication process and how factors related to technology enhance or hinder this process.
EME 5316: Educational Technology Management Issues(3) Explores classroom management issues through appropriate uses of educational technology.
EME 5403: Instructional Computing I (3) *Prereq: baccalaureate degree.* Explores uses of educational technologies and learning environments.
EME 5404: Instructional Computing II (3) *Prereq: EME 5403.* Overview of educational technologies in teaching and learning. Developing meaningful and engaging learning environments that foster critical inquiry in students.
EME 5405: Internet in K-12 Instruction (3) *Prereq: EME 5403 or 4406.* Preparing preservice teachers, in-service teachers, and teacher educators to use the Internet.
EME 5431: Integrating Technology in the Mathematics Classroom (3) Examines technology in use. Multiple methodologies in which technology can be used to create and enhance appropriate learning environments.
EME 5432: Integrating Technology into Social Science Classroom (3) Educational technology tools available for integrating into curriculum. Multiple methods using technology to create and enhance appropriate learning environments.
EME 5433: Integrating Technology into Science Classroom (3) Examines technology use. Applications in learning theory;

philosophy of science instruction; computer applications in science; integration of science with other subject areas; assessment.

EME 6205: Digital Photography and Visual Literacy (3) Explores the main aspects of digital photography and the importance of students being visually literate.

EME 6208: Designing Integrated Media Environments I (3) Design traditional multimedia environments and learn advanced techniques for creating presentation. Importance of cognitive processes and their relationships to design and instruction.

EME 6209: Designing Integrated Media Environments II (3) *Prereq: EME 6208.* Project based. Applying skills and theories learned previously. Real-world problems.

EME 6405: Educational Technology and Teaching (4) *Prereq: EME 5403.* Developing knowledge of computer technology in education and using that knowledge to solve educational problems. Gain experience working with computer systems.

EME 6458: Distance Teaching and Learning (3) *Prereq: EME 5403.* Topics assist educators who teach at distance in synchronous time. Effective teaching methodologies, along with various theories about distance learning, examined.

EME 6505: Educational Television Design and Production (4) Learn to plan, produce, use, and evaluate videotape programs for educational purposes. Learn to operate the major components of a small, nonbroadcast television studio.

EME 6602: Human-Computer Interactivity and the Learner (4) *Prereq: EME 6208, 6405.* Interaction and educational principles driving research. Elements of user interface, user behavior and systems monitoring that behavior, intelligent artifacts, hypermedia, and distributed information systems.

EME 6606: Advanced Instructional Design(3) *Prereq: EME 6609.* Focuses on the student who is becoming an instructional design (ID) Professional by refining skills and adding to the skills learned in the beginning Instructional Design course, building on the foundational knowledge about the practice of ID, and encouraging the development of communication skills through formal project management.

EME 6609: Instructional Design (3) Focuses on the application of instructional design principles to the development of instruction. Topics include contemporary issues and trends in instructional design, foundations in learning research, requirements for instruction, task and needs analysis, learning situations and instructional models, learner characteristics, hardware and software innovations, assessing instructional outcomes, and factors affecting utilization.

EME 6716: Organization and Administration of Educational Media Centers (3) Principles of organizational and administrative theory and procedures and issues related to selecting instructional materials used to operate EMCs at all levels of education.

EME 6935: Seminar: Distance Education Issues and Applications (1; max: 4) Mechanisms and logistics that support distance education development and delivery.

EME 6945: Practicum in Educational Media and Instructional Design (3-8; max: 8) Supervised experiences appropriate to the student's professional goals.
EME 7938: Seminar in Educational Media and Instructional Design (3; max: 9) Seminar for advanced degree graduate students.

Elementary Education

EDE 5940: Integrated Teaching and Learning (3) *Prereq: admission to the master's certification program in elementary education plus 15 credits, EDF 6113, and RED 5316 or 5355.* Student interns develop general pedagogical competencies and skills necessary to successful teachers.
EDE 6225: Practices in Childhood Education (3) *Coreq: EDE 6948.* Elementary school practices related to the fundamental principles of curriculum development; selecting, organizing, and developing effective teaching-learning situations.
EDE 6266: Teaching and Learning in Elementary Classrooms (3) *Prereq: admission to the master's certification program in elementary education.* Introduction to the program.
EDE 6325: Teacher Inquiry/Action Research (3) *Prereq: EDE 6948.* Purpose, goals, and processes of teacher inquiry and application of this methodology in the classroom.
EDE 6905: Individual Work (1-5; max: 12 including ESE 6905) For advanced students who wish to study individual problems in childhood education and/or early childhood education under faculty guidance.
EDE 6910: Supervised Research (1-5; max: 5) S/U.
EDE 6932: Special Topics (1-5; max: 10) *Prereq: consent of department chair.*
EDE 6948: Internship in Elementary Schools (3-12; max: 12) *Prereq: consent of the department. Coreq: EDE 6225.* Supervised teaching in elementary grades K-6.
EDE 7935: Seminar in Elementary Education (1-6; max: 6) *Prereq: EDE 6948. Open to advanced graduate students.* Current research and an overview of the total program.

ESOL/Bilingual Education

FLE 6165: Bilingual-Bicultural Education (3) Foundational principles and practices in the field of bilingual-bicultural education in the U.S. and in other nations. Critical examination of theories and practices related to language policy in education.
FLE 6167: Cross-Cultural Communication for Teachers (3) Critically explores ways educators can establish equitable and culturally responsive classrooms. Examines theories related to language, culture, and social justice.
FLE 6336: Teaching Foreign Languages in Elementary Schools (3) Pedagogy and critical issues related to content-based foreign language instruction and the integration of culture in the elementary

foreign language classroom.

FLE 6337: Methods of Teaching and Assessing Foreign Language in Secondary School (3) Explores the history of foreign language instruction, first- and second-language acquisition, and pedagogical issues of curriculum, methods, and assessment. Field teaching component.

FLE 6946: Practicum in Teaching and Assessing Foreign Languages at Secondary Level (3) *Prereq: consent of department chair.* Directed experiences emphasizing instructional strategies, selecting instructional materials, structuring and sequencing learning tasks, and diagnosing student progress. Practicum in secondary public schools.

TSL 5142: ESOL Curriculum, Methods, and Assessment (3) *Prereq: TSL 3526.* Curriculum, methods, and assessment for second language learners in K-12 classrooms.

TSL 5143: Secondary ESOL Teaching Strategies (3) Teaching skills to be effective with ESOL students in a mainstream content class.

TSL 6140: Curriculum and Materials Development for ESOL K-12 (3) Developing and adapting standards-based curriculum and materials for L2 oral language and literacy, academic content, and K-12 ESOL instruction.

TSL 6240: Language Principles for ESOL Teachers(3) Applied linguistics for teachers. Language-acquisition theories related to learning a second language in school. Connections between language and literacy development and effective instruction for English language learners.

TSL 6373: Methods of Teaching ESOL K-12 (3) Effective oral language and literacy instruction for K-12 English language learners.

TSL 6440: Testing and Evaluation of ESOL (3) Introduction to assessment issues and experience in developing assessment techniques for learners of English as a second language.

TSL 6700: Issues in ESOL for School Counselors and Psychologists (3) Gives school counselors and psychologists an overview of key concepts and issues related to ESOL students in K-12 schools.

Language, Literacy, and Culture

LAE 6319: Language Arts in the Elementary School (3) Speaking, listening, writing, and language study in the elementary classroom.

LAE 6339: Curriculum, Methods, and Assessment in Secondary English Language Arts(3) *Prereq: 30 hours of upper-division English. Designed for Proteach students only.* Introduction to the theory and practice of teaching English.

LAE 6348: Teaching Multiliteracies (3) Application of theory and methods in teaching multiple modes of literacy.

LAE 6365: Language Arts: Language and Composition (3) Methods and materials for teaching language and composition in the secondary school. This course and LAE 6366, in conjunction,

comprise methods and materials for teaching English in the secondary school.

LAE 6366: Language Arts: Literature (3) Theory and method for teaching literature in the secondary school. This course and LAE 6365, in conjunction, comprise methods and materials for teaching English in the secondary schools.

LAE 6407: Early Childhood Children's Literature (3) *Prereq: a course in children's literature.* Methods of involving young children (birth through kindergarten) with literature and the role of literature in the home and school.

LAE 6446: Multicultural Literature for Children and Adolescents (3) Examines diverse cultures and theories in multicultural literature.

LAE 6455: International Children's Literature (3) Examine and develop curriculum for children's literature from around the world.

LAE 6616: Seminar in Children's Literature (3; max: 9) *Prereq: LAE 3005.* Trends and issues in children's literature and teaching literature. Topics rotate.

LAE 6635: Teaching Adolescent Literature in the Secondary School (3) Explores what adolescent literature is and examines the theory and practice of teaching it in grades 7-12.

LAE 6714: Children's Literature in the Childhood Curriculum (3) Evaluating, selecting, and using fiction, biography, poetry, and informational books for instructional, informational, and recreational purposes.

LAE 6861: Technology and Media Literacy (3) *Prereq: LAE 6366.* Methods and materials for integrating technology and media literacy in secondary English classrooms.

LAE 6939: Literacy, Family, and Culture(3) Examines various literacy patterns of students with non-mainstream cultural, social, and linguistic backgrounds; explores the impact of home literacy on school learning.

LAE 6945: Practicum and Assessment for Teachers of Secondary School English (3) *Prereq: consent of department chair.* Directed experiences focused on applying instructional strategies, ssessing student progress, and reflecting on ethical issues. Includes experiences in field and laboratory work.

LAE 6946: Children's Literature in Educational Settings (3) *Prereq: LAE 3005.* Field studies in library or school settings with high involvement in children's literature.

LAE 7006: Language Acquisition and Education(3) First language acquisition and implications for curriculum and instruction.

LAE 7519: Language and Inquiry(3) Examines inquiry and its implications for curriculum and instruction.

LAE 7715: Research in Children's Literature(3) Research and research methodologies in children's literature and teaching literature.

LAE 7934: Seminar in Composition Theory and Practice(3) Examines the theory of composition, and research on the impact of writing.

LAE 7936: Seminar in English Language Arts (3; max: 6)

Prereq: consent of instructor. Contemporary developments and research in English language arts and education.

Mathematics Education

MAE 5327: Middle School Mathematics Methods (3) Mathematics materials, planning, and presentation.
MAE 5332: Secondary School Mathematics Methods and Assessment (3) *Prereq: preparation in the subject area equivalent to the requirements for high school certification.* Patterns of mathematics curriculum; practices in teaching mathematics; preparing, selecting, and using instructional materials; assessment techniques.
MAE 5347: Teaching K-8 Mathematics for Understanding (3) *Prereq: MAE4310 or consent of instructor.* Instructional strategies to support young learners' mathematical understanding.
MAE 5395: Multicultural Mathematics Methods (3) *Prereq: MAE 4310 or MAE 5318.* Mathematics education methods from a multicultural perspective.
MAE 5945: Secondary School Mathematics Practicum (3; max: 6) Directed experiences emphasizing instructional strategies, selecting instructional materials, sequencing student activities, using instructional moves, and diagnosing student progress. Field and laboratory settings.
MAE 6313: Problem Solving in School Mathematics (3) Analyzes problem solving as an underlying theme in elementary mathematics for preservice teachers. Emphasizes development of pedagogical content knowledge in elementary school mathematics.
MAE 6615: Individualizing Instruction in Mathematics (3) Organizing a continuous progress program: objectives, diagnostic testing, student placement, record keeping, evaluation, and reporting. The role of the teacher and team teaching. Developing a bank of materials, games, and activities for an individualized mathematics program.
MAE 6641: Readings and Research in Mathematics Education (3; max: 6) Examines readings and research that represent past, current, and future trends.
MAE 7899: Mathematics Education Seminar (3) *Prereq: MAE 6138.* Issues and problems in mathematics education. Investigating and planning research relevant to selected problems.

Reading Education

RED 5046: Foundations of Reading in Grades PreK-12 (3) Examination of diverse cultures and theories in multicultural literature.
RED 5316: Reading in the Primary Grades (3) Advanced issues related to the emergence and development of literacy in young children.
RED 5337: Reading in the Secondary School (3) Patterns of reading instruction in the secondary school; methods of teaching

reading for teachers of all subject areas; preparing, selecting, and using instructional materials; selected field or micro-teaching experiences.

RED 5355: Reading Instruction in the Intermediate Grades (3) Emphasizes materials and methods for teaching reading to students in the upper elementary grades, middle, and junior high schools.

RED 6346: Seminar in Reading (3; max: 9) *Prereq: consent of instructor.* Variable topics on reading and literacy.

RED 6520: Classroom Literacy Assessment and Instruction (3) *Prereq: minimum of 1 introductory reading instruction course.* Using classroom assessment information to guide literacy instruction.

RED 6546C: Diagnosis of Reading Difficulties (3) Individual assessment techniques for locating difficulties in literacy acquisition.

RED 6548C: Remediation of Reading Difficulties (3) *Prereq: RED 6546C.* Advanced procedures and practices for remediating reading difficulties in the classroom and clinic.

RED 6647: Trends in Reading (3) Understanding current trends and issues in literacy education.

RED 6941: Practicum in Diagnosis and Remediation of Reading Difficulties (3) Diagnosis and remediation of reading difficulties with at-risk K-12 learners.

RED 7019: Foundations of Literacy (3) Foundational understanding of theories and discussions related to (and research methods involved in) studying literacy and literacy education.

RED 7817: Understanding Reading Difficulties (3) *Prereq: RED 6546C, 6548C.* Examines reading difficulties from various perspectives, including cognitive, sociocultural, and linguistic.

Science Education

SCE 5316: Inquiry-Based Science Teaching (3) *Prereq: SCE 4310.* Inquiry into science content pedagogy and practice in elementary classrooms.

SCE 5355: Foundations of Science Teaching (3) *Prereq: SCE 4310 or equivalent.* Transforming unifying science themes into teaching and learning activities appropriate for K-8 classrooms.

SCE 6045: Environmental Education Methods and Materials (3) Overview of current environmental education teaching approaches, activities, programs, and curricula in school and nonschool settings.

SCE 6117: Science Education in the Elementary School (3) Current problems, new materials and teaching techniques, research and recent developments in the sciences.

SCE 6290: Science Instruction in Informal Settings (3) Review of theory and practice research on instructional techniques and curricula for K-12 science instruction in informal settings such as museums, nature centers, zoos, and outdoor school yards.

SCE 6338: Secondary Science Methods and Assessment (3) Introduction to the theory and practice of teaching secondary school science, emphasizing planning, instruction, and assessment.

SCE 6947: Practicum in Secondary Science Teaching and

Assessment (3) *Prereq: consent of department chair.* Directed experiences emphasizing instructional strategies, selecting instructional materials, sequencing student activities, using instructional moves, and diagnosing student progress. Field and laboratory settings.

Secondary Education

ESE 6215: The Secondary School Curriculum (3) Scope, function, and types of secondary school curricula and ways of improving existing programs.
ESE 6344: Classroom Practices and Assessment in Secondary Education(3) Practical applications of recent research on effective classroom practices.
ESE 6345: Effective Teaching and Classroom Management (3) *Prereq: consent of departmental.* Advanced strategies for planning and presenting the general academic content of mathematics, science, foreign language, social studies, and English in the secondary school.
ESE 6905: Individual Work (1-4; max: 12 including EDE 6905)
ESE 6939: Special Topics (3; max: 10)
ESE 6945: Student Teaching in Secondary School (3-9; max: 9) *Prereq: consent of instructor.* Supervised teaching in the secondary school, Grades 6-12.

Social Foundations

EDF 5552: Role of School in Democratic Society (3) Common conceptions of democracy, equality, freedom, liberty, and equality and what these conceptions imply for educational aims and practice.
EDF 6520: History of Education (3) Salient issues in education from the Reformation to the present.
EDF 6544: Philosophical Foundations of Education (3) Philosophical bases for democracy and education.
EDF 6606: Socioeconomic Foundations of Education (3) Sociological analysis of democratic educational aims, the school as a social system, interest groups, the teaching profession, and economic stratification in America.
EDF 6616: Education and American Culture (3) Graduate-level introduction to the social foundations of education (history, philosophy, and sociology).
EDF 6630: Educational Sociology (3) Sociological theory and research with direct relevance to the study of education.
EDF 6812: Comparative Education (3) Relationships of school and society in different cultural areas of the world.
EDF 6820: Education in Latin America (3) Traditions and contemporary social, political, and cultural aspects.
EDF 7555: Values and Ethics in Education (3) The conception and role of values in education, with special emphasis on moral values (ethics).
EDF 7934: Seminar in Educational Foundations (3; max: 12)

Advanced study in historical, philosophical, social, and comparative foundations.

Social Studies Education

SSE 5320: Middle School Social Studies Methods (3) Examines and applies instructional procedures and materials, focusing on social studies in Grades 6-8.
SSE 5945C: Practicum in Secondary Social Studies Teaching and Assessment (3) Directed experiences emphasizing instructional strategies, instructional materials, and student assessment. Field and laboratory settings with microteaching assignments.
SSE 6046: Perspectives in Social Studies Education (3) Seminar analyzing works written by important social studies educators.
SSE 6117: Social Studies Education––Elementary School (3) *Prereq: graduate curriculum course.* Contributions of social education to the total elementary school program, emphasizing social interaction and programs and procedures in the social studies area.
SSE 6133: Secondary School Social Studies Methods and Assessment (3) Preparing, selecting, and using instructional methods, materials, and assessments in the social studies content area.
SSE 6478: Global Studies Methods in Social Studies (3) Comprehensive overview of standards-based global issues appropriate for study in Grade 6 to 12 social studies classes.

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Theatre and Dance

College of Fine Arts

Graduate Faculty

Chair: K. A. Marshall. *Graduate Coordinator:* M. L. Pinkney. *Complete faculty listing by department*: Follow this link

The graduate program offered by the School of Theatre and Dance leads to the degree of Master of Fine Arts in theatre. Minimum requirements for this degree are given in the *General Information* section of this catalog.

The M.F.A. degree prepares students for professional entry in acting, production, or teaching. Placement in the M.F.A. program is determined by audition/portfolio review, academic credentials, and personal interview. Candidates for admission should have adequate training in theatre. Deficiencies may be corrected before beginning graduate study.

The program emphasizes the study and practice of theatre as an art and discipline. Students of acting and design study concepts of theatre together while working in their areas of specialization. Focus is on the collaboration and synthesis of theatre artistry. Each incoming class is composed of approximately 12 to 18 students in acting and all design areas.

The student's artistic and academic progress will be reviewed at the end of each semester. The *School of Theatre Handbook* gives details on the form and focus of each review. This information is online at http://www.arts.ufl.edu/theatreanddance/pages/whatyouneedtoknow/downloads/downloads.asp.

During the final year of study, each student must successfully complete the comprehensive examination and oral defense. The project in lieu of thesis includes research, analysis, rehearsal process, and evaluation. Development and execution of the project includes public performance (acting or design). The written document and oral defense of the project which

follow must demonstrate the ability to communicate the creative process.

Graduate acting students audition for all departmental productions.

ARC 6670: Lighting Design Seminar(3; max: 6) Design problems investigating theoretical, conceptual, and practical applications of illumination systems through speculative and analytical inquiry.
DAA 6757: Pilates Technique for the Dancer(1-3; max: 6) *Prereq: consent of instructor.* Systematic achievement of strength, tone, flexibility, and posture for optimal physical performance in dance.
DAA 6905: Graduate Dance Project (1-3) Dance to enhance and develop skills in a specific style of dance or movement study.
DAA 6xxx: Dance Clinical Practice (1-3; max: 6) *Prereq: DAN 3775 and consent of instructor.* Clinical experience in using movement to enhance healing in a hospital or community setting. Student works through Shands Arts in Medicine or a comparable program, in individually contracted situations.
DAN 6436: Laban Movement Analysis(3; max: 6) *Prereq: consent of instructor.* Experiential examination of movement from the integrated theoretical framework of body, effort, shape, and space.
THE 5238: African-American Theatre History and Practice (3) *Prereq: THE 2000 or 2020 or consent of instructor.* Origins and development of theatre by, for, and about Black America from the 18th century to the present.
THE 5287: History of Decor and Architecture for the Stage(3) Architecture and decor from prehistory to the 19th century as they reflect time and spirit in preparation for play production.
THE 5910: Introduction to Graduate Study in Theatre (1) Research methods, examination and thesis preparation, and classroom pedagogy for first-year MFA students.
THE 6265: Costume History (3) *Prereq: admission to MFA.* Examines the history of fashion and costume, and its relation to the general intellectual, moral, and cultural climate of an era; and how the theatrical designer applies this analysis.
THE 6525: History, Literature, and Criticism I (3) Readings and discussions of Western and Japanese dramatic literature and criticism from their beginnings to the 18th century.
THE 6526: History, Literature, and Criticism II (3) Readings and discussion of Western dramatic literature and criticism from the 18th Century to the present. Also includes units on African, Indian, and Chinese theatre.
THE 6565: Seminar in Creative Process (3) Specialists in all areas of theatre explore the similarities in their creative thinking and methods.
THE 6905: Individual Study (1-9; max: 9) *Prereq: consent of instructor.* Reading, research, or performance project.
THE 6940: Supervised Teaching (1-5; max: 5) S/U.
THE 6941: Internship (1-9; max: 9) Practical experience in residence with a professional theatre or equivalent. S/U.
THE 6950: Applied Theatre (1-3; max: 9) Specialized practical experience achieved through participation in realized productions.
THE 6955: Summer Repertory Theatre (3-9; max: 9) *Prereq: consent of instructor.* Practical experience in repertory theatre, directly applying skills in all areas of theatre production.
THE 6971: Research for Master's Thesis (1-15) S/U.
THE 6973C: Project in Lieu of Thesis (1-9; max: 9) *Prereq: admission to candidacy.* Creative project in lieu of traditional written thesis. S/U.
TPA 5025: Lighting Design I (3) *Prereq: admission to MFA or consent of instructor.*

Advanced applications. In-depth practice of design concept formulation, use of advanced equipment, and complex scenographic documentation. Introduction to CAD for the lighting designer.

TPA 5047: Costume Design I (3) *Prereq: admission to MFA. Development of skills required for costume design.* Emphasizes character and play analysis for the costume designer.

TPA 5067: Scene Design I (3) *Prereq: TPA 4066; admission to MFA or consent of instructor.* Study and practice of the scenic design process. Developing scenic design techniques for theatre and dance. Emphasizes script analysis for the scenic designer.

TPA 5072: Drawing and Rendering (3) *Prereq: admission to MFA.* Application of advanced drawing and painting techniques for theatrical design. Mastering different media through experimentation. Using advanced techniques to enhance visual communication.

TPA 5079: Graduate Scene Painting (3) *Prereq: TPA 2075 or admission to MFA.* Advanced techniques in scene painting. Developing textural illusion, and enhancing volume through light and shadow.

TPA 5082: Advanced Theatre Graphics(3) *Prereq: TPA 4066; admission to MFA.* Rendering for theatrical design. Traditional techniques, computer aided applications, and model building.

TPA 5236: Costume Technologies Workshop (3; max: 9) *Prereq: consent of instructor.* Costume crafts work through realized projects. Possible topics: millinery, stage jewelry, masks, prosthetics, wigs, puppetry, footwear, and dyeing.

TPA 6005: Design I (2) Applying the fundamental techniques of set, light, and costume design to various styles of dramatic literature.

TPA 6006: Design II (3) *Prereq or coreq: TPA 6005.* Experience in design under simulated production conditions. Designers working in their major and minor areas of specialization.

TPA 6009: Design Studio (3) *Prereq: admission to MFA.* Investigation of design theory, research, concept, and presentation used in production of theatre and dance.

TPA 6026: Lighting Design II (3) *Prereq: TPA 5025.* In-depth study of processes. Refinement of aesthetic concept, complex productions, state-of-the-art technologies, CAD applications, and lighting for built environment.

TPA 6048: Costume Design II (3) *Prereq: TPA 5047.* Advanced study. Specialized costume design problems for individual projects.

TPA 6054: Detail Design for Costume Designers(3; max: 6) *Prereq: TPA 6048 or consent of instructor.* Intensive study and practical application of designing specific motifs and accessories for costumes.

TPA 6069: Scene Design II (3) *Prereq: TPA 5067 or admission to MFA.* Design work in a variety of genres. Complex multi-set productions.

TPA 6235: Costume Construction (3; max: 9) *Prereq: consent of instructor.* Detailed study of patterning and construction techniques used in men's and women's dress. Extensive hands-on work with contemporary and historical garments.

TPA 6237: Pattern Making: Flat Patterning (3; max: 6) *Prereq: consent of instructor.* Using flat pattern techniques to create garments. Emphasizes period details.

TPA 6243: Pattern Making: Draping(3; max: 6) *Prereq: consent of instructor.* Advanced study of draping methods of costume creation. Extensive hands-on work using the sculptural qualities of fabric and clothing.

TPA 6258: Computer Drafting 2D (3) *Prereq: admission to MFA.* Study of computer aided drafting for the theatrical designer. Emphasizes techniques for the scenic and lighting designer.

TPA 6357: Programming and Presentation for the Lighting Designer (3) *Prereq: TPA 5025, 6026.* Intensive use of high-end software for programming and presenting lighting-design concepts, for the advanced designer.

TPP 5234: Mutli-Cultural Performance Workshop (1) Character and scene study using original material and a canon of minority and marginalized artists.

TPP 6115: Acting I (3) Experimentation and experience in psychological realism: analysis,

technical skills, and contacting the emotions.
TPP 6116: Acting II (3) Experimentation and experience in nontraditional and period plays: analysis, research, and technical skills.
TPP 6225: Professional Seminar: Acting (1) Performance techniques and methods for film, television, and theatre.
TPP 6237: MFA Company Acting Workshop(1-6; max: 24) Stdent actors study, experiment, and produce in a laboratory emphasizing specialized skills and methods; and nonrealistic and period genres.
TPP 6285: Voice and Movement I (3) Vocal skills, emphasizing versatility, production, power, and strength.
TPP 6286: Voice and Movement II (3) Physical and vocal skills unique to the execution of nontraditional and period roles.
TPP 6385: Directing (3) Explores the philosophy and psychology of directing and the director. Applied to scene study.
TPP 6946: Performance Practicum (3) Training in specialized areas of performance.

The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404 679 4501) to award associate, bachelor's, master's, doctoral, specialist, engineer and professional degrees.

Tourism, Recreation, and Sport Management

College of Health and Human Performance

Graduate Faculty

Chair: M. Sagas. *Graduate Coordinator:* C. Williams.
Complete faculty listing by department: Follow this link

The degree Master of Science is offered by the Department of Tourism, Recreation, and Sport Management with programs in sport management and in recreation, parks, and tourism. Both programs offer thesis and non-thesis formats. The Department participates in the Ph.D. program in health and human performance. Minimum requirements for these degrees are given in the General Information section of this catalog.

The master's program provides advanced preparation of tourism, recreation, and parks and sport management professionals for positions of leadership in planning, developing, administering, and marketing of programs in a variety of employment settings. Concentrations of study may be developed in a number of areas, such as

--Recreation resource planning and management
--Tourism and commercial recreation
--Campus recreation
--Recreation administration and supervision
--Sport management

The doctoral program is offered through the College of Health and Human Performance with concentrations in recreation, parks and tourism, and sport management. These interdisciplinary

specializations blend course work and research. The curriculum is individualized, and applicants with bachelor's degrees from unrelated fields are accepted into the program. However, their previous work will be evaluated and their programs planned according to their individual needs, interests, and career objectives.

Combined program: The Department offers a combined bachelor's/master's degree program. This program allows qualified students to earn both a bachelor's degree and a master's degree with a savings of one semester.

Concurrent program: The M.S./M.B.A. is a 3-year concurrent degree program offered in conjunction with the Warrington College of Business Administration. The program gives interested students an opportunity to complete course work from the two colleges with a residency in sport management. Applicants must apply to both programs, noting on the application the joint nature of the request, and must meet the admission requirements of both colleges.

MS/MSM Concurrent Degree Program: This joint degree program is offered through the College of Business Administration (Master of Science in Business Management [MSM]) and the College of Health and Human Performance's, Department of Tourism, Recreation and Sport Management (Master of Science in Sport Management [MS]). The MS/MSM is a non-thesis degree. The MS/MSM is designed for students who seek a graduate business degree and who lack the work experience necessary for admission to the MBA program. The MS/MSM curriculum is similar to the first year of the MBA program, giving students a good foundation in business principles.

M.S./J.D. joint program: This 98-credit-hour joint degree program culminates in the Master of Science and the Juris Doctor degrees. Applicants must meet the entrance requirements for the Department of Tourism, Recreation, and Sport Management and the College of Law. Admission to the second degree program is required no later than the end of the fourth consecutive semester after beginning one of the degree programs. The student's supervisory committee comprises faculty members from both the Department of Tourism, Recreation, and Sport Management and the College of Law.

HLP 6515: Evaluation Procedures in Health and Human Performance (3) Evaluation and interpretation of tests and analysis of research data.
HLP 6535: Research Methods in Health and Human Performance (3) Introduction to research methodology and design.
HLP 7979: Advanced Research in Health and Human Performance (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field, or for students who have been accepted for a

doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

HLP 7980: Research for Doctoral Dissertation (1-15) S/U.

LEI 5188: Trends in Leisure Studies (3) Introduction to issues and trends pertinent to leisure, recreation, and tourism. Influence of social, demographic, and environmental changes on leisure behavior examined drawing on relevant theories, empirical research, and contemporary articles to frame analysis.

LEI 5255: Outdoor Recreation and Park Management (3) History and current issues of outdoor recreation, preservation, and conservation policy in U.S. Review of government and private roles in providing outdoor recreation opportunities. Synthesis of social science research on outdoor recreation behavior and implementation of strategies utilizing current research in park management operations to improve visitor experiences.

LEI 6108: Contemporary Theories of Recreation and Leisure (3) Understanding of leisure and recreation as they relate to social, psychological, and economic constructs. Examination of current studies of leisure behavior. Investigation of both holistic and particular dimensional viewpoints and approaches in determination of leisure behavior.

LEI 6495: Campus Recreation Administration and Programming (3) In-depth examination of operations, innovation, and development of campus recreation offerings at community college, university, and military levels. Facility construction and maintenance, personnel management, and fiscal responsibility for diverse audience, primarily from director's perspective.

LEI 6513: Administrative Procedures in Leisure Services (3) Understanding fundamentals of management and organization behavior theory underlying provision of tourism, recreation, and park facilities and services. Influence of external environment on management procedures emphasized.

LEI 6514: Administrative Issues in Recreation, Parks, and Tourism (3) *Prereq: LEI 6513.* Integration of prior courses through an in-depth study and discussion of the critical issues and concerns that influence provision of recreation, parks, and tourism services. Specific issues reflect students' concentration and interest, as well as recent developments in administrative practice.

LEI 6515: Legal Issues in Recreation, Parks, and Tourism (3) Comprehensive study of legal, safety, and risk management issues relevant to field of recreation. Identification of implications for theoretical and applied research in recreation law and risk management; foundation of legal concepts and issues; implications for management of risk and improvement of safety; and impact of law on policy formation and decision-making.

LEI 6557: Recreation Management/Development in the Coastal Zone (3) Introduction to the coastal environment as a predominant setting for recreation activity and development. Examines specific recreational problems associated with coastal zone management within the framework of coastal resources. Survey of public-private issues, planning concerns, and user conflicts common

in the coastal zone.

LEI 6578: Advanced Marketing for Recreation, Parks, and Tourism (3) *Prereq: LEI 6895.* Examination of multidimensional marketing functions common to complex recreation, park, and tourism organizations. Emphasis on strategic planning in marketing and its use by recreation, parks, and tourism organizations. Class project in tourism marketing helps develop more in-depth understanding and appreciation of application of marketing to local agency.

LEI 6834: Ecotourism (3) Examination of tourism development in hospitality and tourism industry. Emphasis on planning and impacts to area. Case studies used to understand planning and development issues in various destinations worldwide emphasizing how tourism policy affects destination.

LEI 6837: Tourism Planning and Development (3) Examination of development in hospitality and tourism industry. Case studies used to understand planning and development issues in various destinations around the world. Emphasis on impact of tourism policy on area.

LEI 6838: Sport Tourism (3) Analysis of the interconnectedness of sport and tourism for behavioral, historical, economic, management, marketing, environmental, and policy perspectives.

LEI 6839: Heritage Tourism (3) Theory, practice, history, terminology and current issues of cultural heritage tourism planning and management. Basic survey of cultural and heritage components: motives and behaviors of heritage tourist attractions (museums, arts, festivals/events, and landscapes), interpretation, economics, and policies.

LEI 6895: Tourism Theory and Concepts (3) Analysis of theories, concepts, and issues related to tourism. Topics include sociocultural impacts of tourism, tourist roles, definitions of tourism, tourist motivations, issues of inequality, terrorism and tourism, sex tourism, and tourism and urban regeneration.

LEI 6903: Readings in Recreation, Parks, and Tourism (1-3; max: 6) *Prereq: Intended for master's students.* Selected independent, in-depth readings on a specific topic. Readings will be supervised and evaluated. S/U.

LEI 6905: Directed Independent Study (1-5; max: 10) Individual projects under faculty guidance.

LEI 6910: Supervised Research (1-5; max: 5) S/U.

LEI 6931: Special Topics in Recreation, Parks, and Tourism (1-3; max: 6) *Prereq: Intended for master's students.*

LEI 6935: Seminar in Recreation, Parks, and Tourism (3; max: 6) *Prereq: Intended for master's students.* Discussion of research topics, including contemporary issues in recreation, parks, and tourism. S/U.

LEI 6940: Supervised Teaching (1-5; max: 5) S/U.

LEI 6944: Practicum in Leisure Studies (1-6; max: 6)

LEI 6971: Research for Master's Thesis (1-15) S/U.

LEI 6XXa: Marketing in Hospitality/Tourism(2) Provide marketing analysis of the hospitality and tourism industry, covering

key marketing principles in practices, discussing tourism and hospitality marketing strategies. Case studies used to develop an understanding of the interrelationship among the marketing concepts covered in this course, allowing students to take the proper marketing steps and make decisions given the latest trends in tourism and hospitality.

LEI 6XXX: Hospitality Law and Risk Management(2) Law and Risk Management in the context of hospitality, including principles, tools, techniques and methods employed in order to be effective in reducing the risk of liability in the hospitality setting.

LEI 7163: Foundations of Leisure Behavior (3) Advanced examination of sociological, socio-psychological, and philosophical literature in leisure studies. Topics include leisure definitions debate; influence of gender, race, class, and age on leisure; time crunch and commodification of leisure; and role of leisure in 21st century society.

LEI 7708: Conceptual Issues in Therapeutic Recreation (3) *Prereq: graduate standing.* Theoretical foundations and research efficacy of therapeutic recreation.

LEI 7901: Recreation, Parks, and Tourism in Higher Education (3) *Prereq: required for all doctoral students.* Examines current trends and issues impacting tourism, recreation, and sport management in higher education. Topics include curriculum development, accreditation, distance learning, university organization and governance, university economics, faculty responsibilities, and life in the academy.

LEI 7904: Advanced Readings in Recreation, Parks, and Tourism (1-3; max: 6) *Prereq: intended for doctoral students.* Selected independent in-depth readings on specific topics. Supervised and evaluated. S/U.

LEI 7905: Advanced Independent Study in Recreation, Parks and Tourism (1-3; max: 6) *Prereq: intended for all doctoral students.* Individual projects completed under faculty guidance.

LEI 7933: Advanced Special Topics in Recreation, Parks, and Tourism (1-3; max: 6) *Prereq: intended for doctoral students.*

LEI 7936: Advanced Seminar in Recreation, Parks, and Tourism (3; max: 6) *Prereq: intended for doctoral students.* Discussion of research topics, including contemporary issues. S/U.

PET 5936: Special Topics/Seminars (1-3)

PET 6948: Advanced Practicum (1-5; max: 5)

SPM 5016: Sport Sociology (3) Advanced principles and applications of social issues, within the sport industry. An in-depth look at how amateur and professional sport business enterprises reflect societal values and issues in the arena of sport.

SPM 5206: Sport Ethics (3) *Prereq: 7 or 8 HH/SPM or consent of instructor.* Self-evaluating, examining, and developing philosophy on ethical issues related to sport. Research and discuss major moral and ethical issues related to sport. Opportunities for ethical decision making, using critical analysis.

SPM 5305: Sport Marketing (3) Marketing information systems, pricing strategies, media relations, promotional methods, and

endorsements as they relate to marketing theories. Practical applications and principles.

SPM 5506: Sport Finance (3) Financial theories and practical applications of sport income and expenditures. Principles and procedures of marketing sports in today's society.

SPM 5936: Current Topics in Sport Management(1-3; max: 9) *Prereq: consent of department chair.* Offered, on request of students, to meet special interests inadequately covered in other courses.

SPM 6006: Contemporary Sport Industry (3) *Prereq: graduate status.* Advanced principles and applications.

SPM 6036: Research Seminar in Sport Management (3) Theoretical and practical research information in sport and exercise program management.

SPM 6106: Management and Planning of Sport and Physical Activity Facilities (3) Administrative tasks involved in managing, planning, renovating, and maintaining facilities. Effect on program selection and scheduling in sport and fitness.

SPM 6158: Management and Leadership in Sport (3) *Prereq: 7 or 8 HH/SPM or consent of instructor.* Principles of leadership and management for sport settings.

SPM 6308: Study of Sport Consumer Behaviors (3) *Prereq: graduate status.* Advanced theoretical and practical information in sport consumer studies.

SPM 6716: Risk Management in Sport and Physical Activities (3) *Prereq: graduate sport law or equivalent.* Theory and techniques for research and practical application.

SPM 6726: Issues in Sport Law (3) *Prereq: 7 or 8 HH/SPM or consent of instructor.* Legal effects of regulating and managing amateur and professional sports and wellness programs: injury liability, risk management, constitutional rights of athletes, and contract negotiation.

SPM 6905: Directed Independent Study (1-6) Individual research projects under faculty guidance.

SPM 6910: Supervised Research (1-6) S/U.

SPM 6947: Graduate Internship in Sport Management (3; max: 9) *Prereq: completion of at least 2 semesters of course work applicable to specialization; permission of advisor, written application, and site approval.* On-site full-time practical experience in sport management.

SPM 6948: Advanced Practicum in Sport Management (1-3) On-site practical experience in sport management.

SPM 6971: Research for Master's Thesis (1-15) Research for master's thesis in sport management. S/U.

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Urban and Regional Planning

College of Design, Construction, and Planning

Graduate Faculty

Chair: P. D. Zwick. *Graduate Coordinator:* R. H. Schneider.
Complete faculty listing by department: Follow this link

Doctor of Philosophy: The College offers an interdisciplinary program leading to the Doctor of Philosophy degree in design, construction, and planning. Areas of specialization within this program include architecture, building construction, interior design, landscape architecture, and urban and regional planning. For information, write to the Ph.D. Director, College of Design, Construction, and Planning Doctoral Program, 331 ARCH, P.O. Box 115701.

Master of Arts in Urban and Regional Planning: The Department of Urban and Regional Planning offers graduate work leading to the degree of Master of Arts in Urban and Regional Planning (M.A.U.R.P.). Students are encouraged to enter the program in the fall semester. The program is usually completed in two academic years. The student entering with an undergraduate degree and no graduate study must complete 52 hours of credit for the M.A.U.R.P. degree. Students who have a master's degree in a related field may transfer up to 18 graduate semester hours toward the 52 hour requirement. Such a transfer of credit requires the approval of the Department. The Department encourages students with any undergraduate degree who are interested in the field of planning to apply for admission.

Complete descriptions of the requirements for the M.A.U.R.P. and Ph.D. degrees are provided in the *General Information* section of this catalog.

The urban and regional planning curriculum is designed to provide a set of core studies and contextual projects which prepare the graduate for the practice of planning in public or private agencies at both national and international levels. The core studies include history and theory of planning; planning methods; growth management at local, regional, and state levels; and related studies in community and regional social, natural, and economic systems. Contextual projects include, among many subject areas, urban design, transportation, regional planning, community redevelopment and preservation, housing, real estate, and economic development. The program emphasizes planning, policies, and design for the physical environment. Current specializations include growth management and transportation, urban and environmental design, community and economic development, and planning information and analysis systems. Students are also encouraged to take advantage of the extensive faculty, course offerings, and other resources available in the College of Design, Construction, and Planning and throughout the University. The Department has two research centers: The Geofacilities Planning and Information Center (GeoPlan) and the Center for Building Better Communities.

The curriculum is supported by an extensive GIS laboratory, and a visual aid library. Variation from the core studies may be approved by the Department if the student can demonstrate education and experience to the faculty that would support such an alternative. The M.A.U.R.P. degree is accredited by the Planning Accreditation Board, a joint undertaking of the American Institute of Certified Planners and the Association of Collegiate Schools of Planning, for having achieved the highest applicable standards for graduate education in the field of planning. Graduates of the Department are prepared to practice urban and regional planning.

The Department of Urban and Regional Planning and the College of Law offer a joint degree program (see *Requirements for Master's Degrees* in the *General Information* section of this catalog). Areas of concentration with other programs in the Graduate School may be developed to meet the individual needs of students. In addition to course work the student is required to complete an internship with a public or private planning office and the student must complete a thesis.

The Department reserves the right to retain student work for purposes of record, exhibition, or instruction.

DCP 6931: Special Topics in Design, Construction, and Planning(1-4; max: 6)

DCP 7790: Doctoral Core I (3) Philosophy, theory, and history of inquiry into the processes of design, urban development, and building systems.
DCP 7792: Doctoral Core II (3) *Prereq: DCP 7790.* Urban, environmental, and legal systems in the context of urban development.
DCP 7794: Doctoral Seminar (1; max: 4) *Coreq: DCP 7911; for entering Ph.D. students.* Successfully negotiating graduate school and writing a dissertation.
DCP 7911: Advanced Design, Construction, and Planning Research I (3) *Prereq: STA 6167. Coreq: DCP 7794; for entering Ph.D. students.* Survey and critical analysis of research in the disciplines of design, construction, and planning. Emphasizes theory and methods.
DCP 7912: Advanced Design, Construction, and Planning Research II (3) *Prereq: DCP 7911.* Conducting advanced research in architecture, design, landscape, planning, and construction.
DCP 7940: Supervised Teaching (1-5; max: 5) *Prereq: not open to students who have taken 6940.* Independent student teaching under the supervision of a faculty member. S/U.
DCP 7949: Professional Internship (1-5; max: 5) Professional faculty-supervised practicum.
DCP 7979: Advanced Research(1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
DCP 7980: Research for Doctoral Dissertation (1-15) S/U.
URP 6042: Urban Economy (3) Principles of urban systems, including analytical techniques such as economic base analysis.
URP 6061: Planning Administration and Ethics (3) Administration and management of public and private planning offices; ethics of planning profession.
URP 6100: Planning Theory and History (3) History of planning and the associated development of theory. Synoptic versus disjointed incrementalism and the political setting for comprehensive planning are emphasized.
URP 6122: Alternative Conflict Management (3) *Prereq: graduate standing in college or consent of instructor.* General introduction to field. Case studies, simulations, readings, and external experiences.
URP 6131: Growth Management Powers I (3) Introduction to regulatory and nonregulatory techniques of plan implementation. Relationship of law and politics to the planning process. Police power as the basis for regulation. Mandatory planning and status of adopted comprehensive plans.
URP 6132: Growth Management Powers II (3) *Prereq: URP 6131.* Traditional and innovative approaches to the control of land use. Zoning, subdivision regulation, and other land use control codes. Growth management in modern context.
URP 6203: Planning Research Design (1-3; max: 3) Emphasizes

research design, and literature research; student presentations at appropriate stages in thesis work.

URP 6231: Quantitative Data Analysis for Planners (3) Planning problem formulation, quantitative research skills, and data gathering techniques. Statistical analysis and emphasis on computer applications.

URP 6270: Survey of Planning Information Systems (3) Introduction to concepts and theory associated with desktop GIS as related to urban (real estate) and regional (environmental) planning.

URP 6271: Planning Information Systems (3) Advanced work in planning and analysis customizing the use of large databases. Emphasizes development monitoring systems and information systems in planning.

URP 6272: Advanced Planning Information Systems (3) *Prereq: URP 6271.* Theoretical and practical knowledge about the structure, use, and architecture of georeference database systems. Discusses spatial relationships between network and area-related systems. Developing and maintaining geographic information systems as related to urban and regional planning.

URP 6274: GPS for Planners: Introduction to Global Positioning System (1) Basics of digital field collection using GPS. GPS applications, components, concepts, mission planning, data collection in field, navigation, real-time and postprocessing correction using base station data, and exporting GPS to GIS.

URP 6275: Spatial Database Design and Development (3) Advanced GIS data concepts and practices. Techniques for data creation, quality assurance and quality control, conversion, storage, manipulation, and presentation.

URP 6312: Land Development Planning and Evaluation (3) Standards, criteria, policies, design techniques, and research systems used in designating proposed general distribution; location and extent of the uses of land and of population densities for all public and private land use categories as established by law, regulation, and social and economic justification at all levels of government in the U.S. and abroad.

URP 6341: Urban Planning Project (1-12; max: 12) Projects encompass city wide comprehensive planning examining the interaction of urban and social systems cast in scenarios of future growth and development. H.

URP 6421: Environmental Impact Statements (3) Management and decision-making aspects of impact statements under the U.S. Environmental Protection Act, Florida's Land and Water Management Act of 1972, and as a component of a comprehensive planning process.

URP 6541: Economic Development Planning (3) Major international and national economic development theory, issues and trends as they affect local economic development planning, methods, and practice.

URP 6542: Urban Land Economics (3) Review of land economics within the context of urban and regional planning.

URP 6543: Seminar in Capital Improvement Finance (1) Methods and means of local government finance of capital improvements.

URP 6547: Local Public Finance for Urban Planners (3) *Prereq: URP 6042 or consent of instructor.* Role of local governments in the economy with special emphasis in the provision of urban goods and services, the funding sources for urban governments and the decision-making processes about expenditures and revenues.

URP 6601: State Planning (3) History, development, and administration of state planning in the 20th century with emphasis on recent growth management initiatives.

URP 6603: Development Review(3) Seminar on practice of local government planning with emphasis on development review and land development regulation.

URP 6610: International Development Planning (3) Critical examination of institutions that play a role in development issues in poorer nations within the context of international development strategies, exposing students to dominant strategies and emerging perspectives on international development.

URP 6716: Transportation Policy and Planning (3) Introduction to transportation policy planning in urban context. Transportation policy instruments and policy-making processes, critical issues in transportation policy, history of policy in U.S. at federal, state, and local levels.

URP 6718: Bikeways Planning and Design (3) Planning and designing bicycle paths, greenways, and facilities that form a network for nonmotorized transportation. Oriented toward a systems approach.

URP 6745: Housing, Public Policy, and Planning(3) Supply, demand, and market relationships. History of government housing policy. Exploration of relationship between housing policy and urban and regional planning.

URP 6746: Topical Debates in Housing(3) Current housing problems, theories and approaches. Housing needs, available tools, formulation of recommendations, and examination of effects of implementation. Inclusionary zoning, gentrification, and smart growth.

URP 6821: Transportation and Land-Use Modeling(3) The planning process, modeling and applications for passenger transportation and land-use development of metropolitan areas with respect paid to its contribution to transportation project and policy analysis.

URP 6871: Planning and Design I (3) Lectures, readings, and exercises in planning research and design methods. Emphasis on design graphics and other means of communication.

URP 6872: Planning and Design II (3) *Prereq: URP 6101.* Focus on alternative roles and potential contributions from both private and public sector participants, case studies and exercises in formulation of urban design plans for private and public sectors.

URP 6880: Defensible Space and CPTED in Urban Design (3) Introduction to crime prevention through environmental design

(CPTED) and defensible space in urban planning design.
URP 6884: Community Conservation and Revitalization (3) Community conservation is a major thrust of National Urban Policy. Relates community revitalization and conservation to the methodology of identification of problem areas, planning and replanning for all types of locations, use and adaptive uses. Federal and state assistance, tax incentives, and other programs.
URP 6905: Exploration and Directed Study (1-4; max: 10)
URP 6910: Supervised Research (1-5; max: 5) S/U.
URP 6920: Colloquium (1) Introduction to the field; historical and philosophical concepts, processes, and issues related to the profession of planning. For entering MAURP students. S/U.
URP 6931: Topical Seminar (1-4; max: 6) Current planning opportunity examined.
URP 6933: Planning Information Seminar (1-2; max: 2) Current GIS topics. Discussions of emerging technologies, creative applications of GIS for particular projects, primers on operating systems, remote sensing, and spatial analysis.
URP 6940: Supervised Teaching (1-5; max: 5) S/U.
URP 6941: Urban Planning Internship (1-3; max: 3) Off-campus internship experience. S/U.
URP 6971: Research for Master's Thesis (1-15) S/U.
URP 6979: Terminal Project (1-6; max: 6) This option, in lieu of thesis, accommodates a physical design or plan project which because of its map and graphic content does not fit comfortably within a thesis format. S/U.
URP 6xxa: Urban Form in Cities throughout the Americas(3) Urban form and development theories and how planning interfaces with developmental trends in North, Central, and South America.
URP 6xxb: Advanced Defensible Space in Urban Design(3) *Prereq: URP6880/4884* Advanced analysis of Defensible Space, CPTED, and other place-based crime prevention planning theories and practices in distressed communities.
URP 6xxx: Internet Geographic Information Systems (3) *Prereq: URP6270* Examines the theoretic and technological background in the emerging technologies in web-based geographic information systems (GIS).

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Veterinary Medical Sciences

College of Veterinary Medicine

Graduate Faculty

Chair: D. Freeman. *Graduate Coordinator (Large Animals):* S. Robertson. *Graduate Coordinator (Small Animals):* E. Jacobson. *Complete faculty listing by department*: Follow this link

The College of Veterinary Medicine offers graduate study leading to the Master of Science and Doctor of Philosophy degrees in veterinary medical sciences. The College also offers certification and a nonthesis concentration in forensic toxicology via web-based distance education. Minimum requirements for the Master of Science and Doctor of Philosophy degrees are described in the *General Information* section of this catalog.

The program provides extensive training in basic and applied research for qualified students with a baccalaureate degree or a D.V.M. or equivalent degree. Applicants are expected to have a background in the biological sciences, mathematics, chemistry, and physics. Particular attention is paid to the advanced education of veterinarians, those interested solely in research, and those interested in combining their graduate study with residency training in a clinical specialty. The College offers three areas of specialization within the veterinary medical sciences program:

Large and Small Animal Clinical Sciences: Physiology, endocrinology, aquatic animal health, fish diseases, gastroenterology, immunology, vision sciences, perinatology, reproductive biology, pharmacokinetics, veterinary sports medicine, and wildlife and zoological medicine (S. Robertson and E. Jacobson,

Graduate Coordinators).

Physiological Sciences: Comparative anatomy, physiology, pharmacology, biochemistry, neurobiology, nutrition, reproductive biology, and toxicology (R. Reep, Graduate Coordinator).

Infectious Diseases and Experimental Pathology: Bacteriology, parasitology, virology, immunopathology, molecular mechanisms of disease and host defense, epidemiology, and veterinary public health (M.T. Long, Graduate Coordinator).

The College participates in the interdisciplinary specialization in toxicology, in cooperation with other departments and colleges in both the Health Science Center and the Institute of Food and Agricultural Sciences and with the Center for Environmental and Human Toxicology (see the Toxicology description under *Interdisciplinary Graduate Studies*).

The following courses in related areas are acceptable for graduate major credit in veterinary medical sciences: **Physiological Sciences:** ANS 6704, ANS 6751, BCH 5413, BCH 6206, BCH 6415, BCH 6740, BMS 6510, GMS 6400C, GMS 6735, GMS 7706C, GMS 7743. **Infectious Diseases and Experimental Pathology:** BCH 5413, BCH 6415, BMS 603, GMS 5304C, GMS 6140, GMS 6152, GMS 6330, GMS 6332, GMS 6333, GMS 6381, GMS 6382, GMS 6421, STA 6207, STA 6166, STA 6176. **Large and Small Animal Clinical Sciences:** all of the above.

GMS 6070: Sensory and Motor Systems (1; max: 2) *Prereq: medical, veterinary, or dental neuroscience.* Analyzing neural coding by model sensory or motor system, depending on student's research interest. Offered fall term.
GMS 6074: Comparative and Evolutionary Neurobiology (3) *Prereq: GMS 6007 or consent of instructor.* Broad perspective of nervous system evolution, structure, and function in different species. Comparisons of cytoarchitectural principles that produce mammalian nervous systems are additional focus.
GMS 6077: Neural Degeneration and Regeneration (1) *Prereq: consent of instructor.* Fundamental cytological, molecular, neurophysiological, and behavioral features associated with neural tissue reactions to trauma and neurodegenerative disease. Offered spring term.
GMS 6312: Clinical Chemistry and Toxicology (3) Comprehensive review of analytical techniques used in clinical chemistry and toxicology, and interpretation of laboratory data.
GMS 6313: Clinical Chemistry and Toxicology: A Rotation (2-20; max: 20) *Prereq: GMS 6312.* Participation in all phases of practical clinical chemistry and toxicology. Chemical methodology, clinical interpretation, and significance of laboratory measurements used in diagnosing diseases. Individual investigative project in clinical chemistry and toxicology. Pathology graduate students

specializing in clinical chemistry must spend 3 semesters on this rotation. S/U.

GMS 6393: Seminar in Clinical Chemistry (1; max: 7) *Prereq: consent of instructor. Coreq: GMS 6312.* Reports and discussions of current research and clinical literature presented by faculty, invited speakers, and graduate students. S/U.

PHC 6107: Introduction to Veterinary Public Health (1) *Prereq: admission to DVM/MPH program, or consent of instructor.* Seminar introducing DVM/MPH students to veterinary public health. S/U.

PHC 6107C: Introduction to Veterinary Public Health Lab(1) *Prereq: admission to DVM/MPH program.* Seminar introducting DVM/MPH students to veterinary public health.

VME 5162C: Avian Diseases (3) Causes, epizootiology, diagnosis, and methods of prevention and control of avian diseases. Not open to students who have taken VME 4162.

VME 5244: Physiology: Organ Systems (4) *Prereq: knowledge of general biochemistry.* Emphasizes domestic animals commonly encountered in veterinary medicine. Physiology of nervous, muscle, blood, cardiovascular, respiratory, renal, gastrointestinal, and endocrine systems.

VME 6008: Care of Aquatic Megavertebrates (3) *Prereq: consent of instructor.* Care of Florida megavertebrates including dolphins, other cetaceans, manatees, and sea turtles using lectures, tours, and hands-on experience.

VME 6076C: Andrology (2) Applied male reproductive physiology, anatomy, and assisted reproduction. Later, student presentations of a chosen in-depth area.

VME 6135: Diseases of Laboratory Animals I (3) *Prereq: DVM degree and/or consent of instructor.* Etiology, pathogenesis, clinical signs, gross and microscopic pathology, diagnosis, and control of diseases in laboratory rats, mice, and other rodents. Emphasizes infectious diseases and understanding and preventing complications from disease in modern biomedical research.

VME 6136: Diseases of Laboratory Animals II (3) *Prereq: DVM degree and/or consent of instructor.* Etiology, pathogenesis, gross and microscopic pathology, diagnosis, and control of diseases of laboratory primates, rabbits, ferrets, and miscellaneous species. Emphasizes infectious diseases and understanding and preventing complications from disease in modern biomedical research.

VME 6186: Advanced Topics in Disease Pathogenesis (2-4; max: 10) *Prereq: advanced course in immunology, molecular pathogenesis, or pathology.* Current research on pathogenetic mechanisms of diseases. Molecular and cellular mechanisms of cell injury and death, repair, inflammation, neoplasia, hemodynamic disorders, and other diseases.

VME 6421: Biology and Molecular Biology of Avian Viruses (2; max: 4) *Prereq: general virology and immunology.* Current scientific papers on biology of avian viruses of economic importance and on molecular approaches to understanding gene expression and function for diagnosis and immunization.

VME 6430C: Contemporary Issues in Small Animal Surgery (3;

max: 6) *Prereq: DVM (or equivalent degree); master's students or Small Animal Surgical Residents pursuing a master's degree.* Current or significant scientific papers from the veterinary and human literature, formal presentations will be given on topics relevant to contemporary small animal surgery, including comparative/translational aspects. Emphasizes morbidity and mortality discussions on recent clinical soft-tissue and orthopedic case material. S/U.

VME 6464: Molecular Pathogenesis (3; max: 6) *Prereq: biochemistry, immunology, or consent of instructor.* Papers on mechanisms of pathogenesis and molecular approaches toward diagnosis and control of either parasitic or viral and bacterial diseases. Focus varies each semester.

VME 6565: Histological Techniques for Light Microscopy (2) *Prereq: consent of instructor.*

VME 6602: General Toxicology (3) *Prereq: background in biochemistry, physiology, and pharmacology.* General principles of toxicology. Mechanisms for occurrence of toxic effects in target organs and tissues.

VME 6603: Advanced Toxicology (3) *Prereq: VME 6602.* Survey of the health effects of each major class of toxicants.

VME 6604: Literature Survey in Toxicology (1-2; max: 2) Critical presentation and evaluation of current literature in selected topics in toxicology.

VME 6605: Toxic Substances(3) *Prereq: general toxicology.* In-depth information on signs, symptoms, underlying mechanisms, diagnosis, and management of poisoning by drugs and chemicals.

VME 6606: Ecological Risk Assessment(3) *Prereq: VME 6602.* In-depth information on signs, symptoms, underlying mechanisms, diagnosis, and management of poisoning by drugs and chemicals.

VME 6607: Human Health Risk Assessment(4) Conceptual approaches and computational techniques for quantitative health risk assessment.

VME 6613: Forensic Toxicology I (3) *Prereq: organic chemistry recommended.* Analytical techniques used to examine forensic drug and forensic toxicology specimens.

VME 6614: Forensic Toxicology II (3) *Prereq: VME 6613.* Toxicology of compounds commonly encountered in forensic specimens.

VME 6650: Principles of Mammalian Pharmacology (4) *Prereq: graduate-level physiology course.* Principles of drug action. Emphasizes mechanisms of action and side effects for major drug classes used in humans and other mammals.

VME 6766: Laboratory Quality Assurance/Quality Control (3) Procedures for ensuring quality practices in the analytical laboratory.

VME 6767: Issues in the Responsible Conduct of Research (1) Presentation and discussion of issues; guiding principles and potential pitfalls. S/U.

VME 6771: Research Methods in Epidemiology (3) Design, analysis, and interpretation of epidemiologic studies.

VME 6905: Problems in Veterinary Medical Sciences (1-4; max: 12) H.
VME 6910: Supervised Research (1-5; max: 5) S/U.
VME 6931: Seminar in Veterinary Medical Sciences (1; max: 8) S/U.
VME 6932: Seminar in Physiological Sciences (1; max: 8) Weekly seminar series on topics in comparative physiological sciences, including nervous, cardiovascular, gastrointestinal, urogenital, and musculoskeletal systems. S/U.
VME 6933: Seminar in Infectious Diseases and Experimental Pathology (1; max: 8) Weekly seminar series on topics in infectious diseases of animals presented by students, faculty, and visiting speakers. S/U.
VME 6934: Topics in Veterinary Medical Sciences (1-4; max: 10) *Prereq: consent of instructor.* Studies in topics involving new developments and/or research techniques in veterinary medical sciences.
VME 6935: Seminar in Veterinary Pathology (1; max: 8) *Prereq: histology.* Weekly seminars on pathology of animals, including bone and joint pathology. Presented by residents, graduate students, faculty, and guest speakers.
VME 6936: Seminar in Pathophysiology (1; max: 8) *Prereq: physiology, biochemistry.* Weekly seminar series in mammalian pathophysiology. S/U.
VME 6938: Topics in Aquatic Animal Health(1; max: 4) Presentation/discussion by students of selected articles relating to aquatic animal health, including both vertebrates and invertebrates.
VME 6940: Supervised Teaching (1-5; max: 5) S/U.
VME 6971: Research for Master's Thesis (1-15) S/U.
VME 7979: Advanced Research (1-12) Research for doctoral students in veterinary medical sciences before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
VME 7980: Research for Doctoral Dissertation (1-15) S/U.
WIS 5323C: Impact of Diseases on Wildlife Population (3) *Prereq: WIS 3401 or equivalent.* Diseases of wildlife, with emphasis on their impact on avian and mammalian populations of North America.

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Wildlife Ecology and Conservation

College of Agricultural and Life Sciences

Graduate Faculty

Chair: J. P. Hayes. *Graduate Coordinator:* W. M. Kitchens. *Complete faculty listing by department*: Follow this link

The Department of Wildlife Ecology and Conservation offers Master of Science (thesis and nonthesis option) and Doctor of Philosophy degrees in wildlife ecology and conservation. Requirements for these degrees are described in the *General Information* section of this catalog. Program emphases include wildlife biology, ecology, and management; landscape ecology and restoration; human dimensions; tropical and international conservation; and conservation education. Graduate students should have appropriate undergraduate training in the biological, social, and physical sciences including physics, chemistry, and mathematics. Students with inadequate backgrounds may be required to take (without credit at the graduate level) remedial undergraduate courses pertinent to their fields of interest.

WIS 5323C: Impact of Diseases on Wildlife Population (3) *Prereq: WIS 3401 or equivalent.* Diseases of wildlife, with emphasis on their impact on avian and mammalian populations of North America.

WIS 5496: Research Design in Wildlife Ecology (3) *Prereq: STA 3023 or equivalent; upper-division course in ecology.* Scientific philosophy and logic of modern ecological approaches, and practical research design as applied to wildlife field ecology. Offered fall term.

WIS 5521: Plant-Animal Interactions (3) *Prereq: PCB 4674 and one of the following courses: PCB 4044C or WIS 3401 or PCB*

3601C. Major types of plant-animal interactions and the conceptual and empirical approaches used to study them. Offered even-numbered years.

WIS 5555C: Conservation Biology (3) *Prereq: basic courses in ecology, genetics.* Application of biological and resource management theory to the problem of the conservation of natural communities. Offered fall term.

WIS 6444: Advanced Wetlands Ecology(4) *Prereq: WIS 4443, SOS 4242, EES 6308C, or consent of instructor.* Examination of geology, hydrology, chemistry, flora, fauna, and ecology of major wetland systems in North America.

WIS 6452: Wildlife Ecology (3) *Prereq: WIS 3401 or equivalent.* Population processes of wildlife resources in subtropical and temperate ecosystems, and policy processes governing management structure; experimental testing of community interaction; applying theory to management. Offered fall term of odd-numbered years.

WIS 6455: Wildlife Population Ecology(3) Rigorous background in population analysis covering population growth and regulation, species interactions, life-history theory, and population viability analysis.

WIS 6466: Wildlife Population Modeling(3) *Prereq: one course in calculus or liner algebra; one course in basic or popular ecology.* Theory and applications of life tables, age, and stage-structured matrix population models. Sensitivity analysis and analysis of life table response experiments. Unstructured population models.

WIS 6468C: Pattern and Process in Landscape Ecology(3) Exploration of applied and quantitative methods to explore links between landscape patterns and processes.

WIS 6525: Environmental Interpretation (3) Theory and practice of environmental interpretation for natural resource management. Design, implementation, and evaluation of programming about environment for variety of audiences and settings.

WIS 6544: Administration in Natural Resources(3) Natural resource agency administration primer in budgets, personnel management, program development, leadership, and strategic planning.

WIS 6575: Mammalian Carnivores: Conservation and Management Issues (2) *Prereq: PCB 3034C or 4044C.* Strategies and paradigms for management and conservation of mammalian carnivore populations. Social systems, life history variables, conflicts with human, reintroduction and translocation. Offered spring term of odd-numbered years.

WIS 6578: Human Dimensions of Biological Conservation (3) Interdisciplinary overview of theory and practice of conservation education, communication, and integrated resource management using local and international models.

WIS 6905: Research Problems in Wildlife and Range Sciences (1-6; max: 10) *Prereq: consent of instructor.*

WIS 6910: Supervised Research (1-5; max: 5) *Prereq: consent of instructor.* S/U.

WIS 6933: Seminar (1) S/U.
WIS 6934: Topics in Wildlife and Range Sciences (1-4; max: 10) *Prereq: WIS 6452, 5555C, or consent of instructor.* Advanced concepts and practices in wildlife management and conservation. Topics vary.
WIS 6940: Supervised Teaching (1-5; max: 5) *Prereq: consent of instructor.* S/U.
WIS 6971: Research for Master's Thesis (1-15) S/U.
WIS 6xxx: Wildlife and Agriculture (3) *Prereq: WIS 3401 Wildlife Ecology and Management or equivalent.* Wildlife ecology and management in agricultural lands. Effects of agriculture on wildlife. Policies affecting wildlife in agricultural systems. Methods of integrating wildlife and agriculture. Offered spring term in odd-numbered years.
WIS 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.
WIS 7980: Research for Doctoral Dissertation (1-15) S/U.

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Women's Studies

College of Liberal Arts and Sciences

Graduate Faculty

Director: J.W. Page. *Graduate Coordinator:* F. E. Babb.
Complete faculty listing by department: Follow this link

The Women's Studies program is administered by the Center for Women's Studies and Gender Research. It is an interdisciplinary forum with different degree options for both Master's- and doctoral-level students. It offers students the opportunity to take advantage of scholarship in this dynamic field. Students become acquainted with different research perspectives and methodologies, learn to analyze and access theories about the role of gender in cultural systems and its intersections with other categories of difference such as race, ethnicity, religion, class, sexuality, nation, physical and mental ability, age, and economic and civil status. Faculty and students employ feminist and other appropriate theoretical approaches and methodologies.

The Center offers a regular colloquium series, frequently sponsors speakers, and distributes a semiannual newsletter. The Center in Ustler Hall houses archives, a small library, offices, and meeting space.

Master of Arts (thesis and non-thesis): The Center offers the Master of Arts (M.A.) thesis degree option that requires the completion and defense of a thesis (30 to 33 credit hours), and the Master of Arts non-thesis degree option that requires completion and defense of a project or paper (33 credit hours). Full descriptions of the minimum requirements for these degrees are

provided in the General Information section of this catalog.

All Master's students take a core curriculum of 9 graduate credits (3 courses). For the thesis M.A., the remaining 21-24hours consist of 15 to 18 credits of approved electives and 6 thesis credits. For the non-thesis M.A., 24 credits of approved electives are required.

M.A./J.D. Joint Degree: The faculties of the Levin College of Law and Women's Studies in the College of Liberal Arts and Sciences have approved a joint degree program culminating in both a J.D. degree, awarded by the College of Law, and an M.A (thesis or non-thesis), awarded by the College of Liberal Arts and Sciences. Under this joint degree program, a student can obtain both degrees in approximately one year less than it would take to obtain both degrees if pursued consecutively. A student must satisfy the curriculum requirements for each degree before either degree is awarded. In each case, no less than 12 credits must be taken in each program. The graduate program in women's studies will accept 12 credits of appropriate professional courses toward the M.A. degree. The 12 credits selected from the professional curriculum must be approved by the graduate coordinator upon the recommendation of the student's graduate supervisory committee. Reciprocally, the law school will accept 12 credits of appropriate women's studies courses toward the satisfaction of the J.D. degree. Admission to the second program is required no later than the end of the third consecutive semester after beginning one degree of the joint degree program. A summer term is counted as a single semester.

Ph.D. concentration: The Ph.D. concentration in women's studies provides graduate students an opportunity to develop a thorough grounding in scholarship produced through the intersection of women's studies and other academic fields. Graduate Faculty from many departments and colleges campus-wide participate in this doctoral-level interdisciplinary concentration. For more information see Interdisciplinary Graduate Studies in this catalog or contact the Center for Women's Studies and Gender Research.

Certificates (M.A. or Ph.D. level): Two graduate certificates in women's studies for Master's and doctoral students are offered in conjunction with degree programs in other academic units. The Graduate Certificate in Women's Studies and the Graduate Certificate in Gender and Development require specific sets of course work, designed to give students a thorough grounding in the discipline. The Graduate Certificate in Women's Studies offers students a general overview of the field. The Graduate Certificate in Gender and Development allows students to focus on issues related to gender, economic development, and globalization.

Graduate courses in women's studies are also available from the following academic units or programs:

--Agricultural and Life Sciences
--Anthropology
--Counselor Education
--English
--History
--Journalism and Communication
--Languages, Literatures, and Cultures
--Latin American Studies
--Linguistics
--Medicine
--Philosophy
--Psychology
--Religion
--Sociology
--Teaching and Learning

For more information, contact Dr. Judith Page, 207 Ustler Hall, (352) 273-0387.

WST 5933: Proseminar in Women's Studies (3; max: 6) Proseminar (seminar that prepares you for more advanced work) introducing graduate students to Women's Studies scholarship. Overview of feminist thought, interdisciplinary research, and feminist practice. Students are introduced to scholars in the field, and learn how to design and implement an independent research project appropriate to Women's Studies.
WST 6348: Ecofeminism(3) Holistic framework for understanding connections among environmental, feminist, and social justice issues. Critical analysis of positions within ecofeminist theory.
WST 6508: Contemporary Feminist Theory (3) *Prereq: graduate-level course in feminist theory or equivalent.* Introduction to contemporary theoretical ideas in feminist thought. Often taught with a common theme, in and across disciplines.
WST 6905: Independent Study (1-3; max: 6) *Prereq: consent of instructor and department chair; and 1 women's studies course, or course that counts for women's studies.* Independent reading or research under guidance.
WST 6935: Special Topics in Women's Studies (3; max: 9) Selected topics in gender and women's studies, emphasizing new knowledge production and contributions in feminist scholarship. Examines a specific topic, a major figure, or a current problem in more depth than is regularly possible in a more general course.
WST 6936: Feminist Challenges to Disciplinary Paradigms (3; max: 6) Examines how feminist scholarship can transform traditional disciplines and bodies of knowledge. Acquaints students with the major feminist challenges to ways of thinking in one or more fields of study. Such ways of thinking can include theory, methodology, disciplinary assumptions, and/or applications.
WST 6946: Internship in Applied Women's Studies and Gender Research(1-3; max: 6) *Prereq: permission of program director.*

Practical experience in community. Internship with local agency, group, or business in women's issues.

WST 6957: International Studies in Women's Studies and Gender Research(1-6; max: 12) *Prereq: admission to approved study abroad program and permission of department.* S/U.

WST 6971: Research for Master's Thesis(1-15) S/U.

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Zoology

College of Liberal Arts and Sciences

Graduate Faculty

Chair: A. C. Harmon. *Graduate Coordinator:* Rebecca Kimball.
Complete faculty listing by department: Follow this link

The Department of Zoology offers graduate programs leading to the Master of Science in Teaching, Master of Science, and Doctor of Philosophy degrees. Our program emphasizes Integrative Biology, with integration accomplished through a focus on the theoretical foundations provided by evolutionary biology and ecology. Our faculty has expertise in ecology, evolution, behavior, comparative and environmental physiology, genetics, development, and phylogenetics. We work in a variety of terrestrial and aquatic environments and geographic regions (tropics through subpolar), and on a range of organisms (including plants). Our faculty value integrative research (e.g., by crossing levels of organization from gene expressions to species interactions), linking theory with data (through use of statistical and mathematical tools), and using natural history to guide the development and testing of rigorous conceptual frameworks. Many of our faculty also are interested in applying and testing basic science in applied contexts (e.g., conservation biology and ecotoxicology).

Our approach is highlighted through our first-year, required, graduate course, Integrative Principles. Each student's supervisory committee will recommend additional courses according to the academic background and research plans of the student.

PCB 5307C: Limnology (4) *Prereq: PCB 4044C, CHM 2046.*

Biological, chemical, and physical dynamics of inland waters.
PCB 5415C: Behavioral Ecology(4) *Prereq: ZOO 3513C, 4472C, PCB 4044C, 4674, or consent of instructor.* Theoretical and empirical bases for behavioral adaptations.
PCB 5459: Morphometrics (3) *Prereq: PCB 4044C, 4674, STA 3024, or equivalents.* Quantitative methods of morphological analysis, with applications in ecological, evolutionary, and physiological biology. Emphasizes multivariate techniques.
PCB 5615: Molecular Evolution and Systematics (4) *Prereq: PCB 3063, graduate standing, or consent of instructor.* Patterns and processes of change at the molecular level in populations, species, and higher taxonomic groups, and their systematic implications.
PCB 6049: Seminar in Ecology (1-3; max: 9) Rotating seminar: various topics in ecology.
PCB 6377C: Physiological Ecology of Vertebrates (4) *Prereq: course in physiology.* Physiological mechanisms that influence distribution and ecological relations, water conservation, and energy exchange in vertebrates.
PCB 6447C: Community Ecology (4) *Prereq: PCB 4044C or equivalent, and consent of instructor.* The evolutionary ecology of communities; conceptual and quantitative approaches to community structure; statistics independent projects.
PCB 6496C: Stream Ecology (4) *Prereq: ENY 3005C, PCB 4044C or 3043C, CHM 2046, PHY 2054.* Physical, chemical, and biological interrelationships in flowing fresh water.
PCB 6605C: Principles of Systematic Biology (4) Theory of biological classification and taxonomic practice. Laboratory experience in taxonomic procedures and techniques, including computer methods. Offered spring term in even-numbered years.
PCB 6695: Seminar in Evolutionary Biology (1; max: 5) *Prereq: PCB 4674.* Current thinking. New topic each time offered. Recently published book or symposium proceedings on newly emerging research theme. Supplementary material drawn from evolutionary biology journals. Directed readings.
PCB 6815: Hormone Regulation of Invertebrate Behavior (3) Survey and analysis of invertebrate behaviors regulated by hormones. Invertebrates considered include arthropods, coelenterates, helminths, and molluscs.
PGY 5246: Biophotography (3) Laboratory, field, and darkroom techniques in 35mm still photography for biological research publications, posters, and slide presentations.
ZOO 5115C: Vertebrate Paleontology (3) *Prereq: ZOO 3713C.* Evolutionary history of major vertebrate groups, emphasizing the principles of prehistoric investigations.
ZOO 5486C: Mammalogy (4) *Prereq: ZOO 2203C.* Study of the ecology, natural history, behavior, and evolutionary history of mammals.
ZOO 5939: Seminar in Morphology (2; max: 9) *Prereq: consent of instructor.* Advanced topics in the description, analysis, and evolution of animal form.
ZOO 6005: Integrative Principles of Zoology I (4) Integrative

approach to fundamental principles of ecology, evolution, and comparative biology.

ZOO 6308: Dynamic Optimization Modeling in Behavioral and Evolutionary Ecology (3) Powerful and simple techniques for formalizing hypotheses. Appropriate to address questions of relative fitness of alternative choices or strategies. Instruction in computer programming and dynamic modeling.

ZOO 6406: Biology of Sea Turtles (3) All aspects of biology of sea turtles and how their biology affects their conservation.

ZOO 6456C: Ichthyology (4) *Prereq: ZOO 2203C.*

ZOO 6515C: Ethology (4) *Prereq: graduate standing or consent of instructor.* The evolution, mechanisms, and classification of animal behavior, emphasizing how to design and conduct behavioral research.

ZOO 6542: Nutritional Ecology (3) Interactions of nutrition and ecology, emphasizing how digestive processes regulate animal productivity and plant/animal interactions.

ZOO 6905: Individual Studies (1-8; max: 12)

ZOO 6910: Supervised Research (1-5; max: 5) S/U.

ZOO 6920: Zoology Colloquium (1; max: 9) Readings and oral presentations on general topics in zoology. Discussions with eminent scientists in the discipline. S/U.

ZOO 6927: Special Topics in Zoology (1-4; max: 15)

ZOO 6931: Seminar in Marine Turtle Biology (1-2; max: 5) *Prereq: consent of instructor.* Advanced topics in biology and conservation of marine turtles.

ZOO 6939: Seminar in Animal Behavior (1-3; max: 9) *Prereq: graduate standing or consent of instructor.* Advanced topics in animal behavior.

ZOO 6971: Research for Master's Thesis (1-15) S/U.

ZOO 7979: Advanced Research (1-12) Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been admitted for a doctoral program. Not appropriate for students who have been admitted to candidacy. S/U.

ZOO 7980: Research for Doctoral Dissertation (1-15) S/U.

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