

COURSES OF INSTRUCTION

This list includes for each course the subject abbreviation, catalog number, title, credit hours, class or laboratory hours per week, description, requirements and prerequisites.

4000/6000-Level Courses

4000-level courses with a 6000-level counterpart are identified with an asterisk. Students should refer to the *Graduate Announcements* for the 6000-level description and requirements.

Cross-Referenced Courses

A cross-referenced course is one that can be taken for credit under different departmental subjects. For example, students can take *Herpetology* as either BIOL 4680 or WFB 4680. The student should select the desired departmental subject abbreviation in conference with an advisor. The departmental subject abbreviation may be changed only during the period allowed by the University calendar for adding a course.

COURSE ABBREVIATIONS

AAH	Art and Architectural History
ACCT	Accounting
AGED	Agricultural Education
AGM	Agricultural Mechanization
AGRB	Agribusiness
AL	Athletic Leadership
ANTH	Anthropology
ARAB	Arabic
ARCH	Architecture
ART	Art
AS	Aerospace Studies
ASL	American Sign Language
ASTR	Astronomy
AUD	Audio Technology
AVS	Animal and Veterinary Sciences
BCHM	Biochemistry
BE	Biosystems Engineering
BIOE	Bioengineering
BIOL	Biology
BMOL	Biomolecular Engineering
BT	Biosystems Technology
BUS	Business
CAAH	College of Architecture, Arts and Humanities
CE	Civil Engineering
CES	College of Engineering and Science
CH	Chemistry
CHE	Chemical Engineering
CHIN	Chinese
COMM	Communication Studies
CPSC	Computer Science
CRP	City and Regional Planning
CSM	Construction Science and Management
CTE	Career and Technology Education
CU	Clemson University
CVT	Cardiovascular Technology
DANC	Dance
DPA	Digital Production Arts
DSGN	Design Studies
EAS	East Asian Studies
ECE	Electrical and Computer Engineering
ECON	Economics
ED	Education

EDC	Educational Counseling
EDEC	Early Childhood Education
EDEL	Elementary Education
EDF	Educational Foundations
EDLT	Literacy
EDSC	Secondary Education
EDSP	Special Education
EES	Environmental Engineering and Science
ELE	Executive Leadership and Entrepreneurship
EM	Engineering Mechanics
ENGL	English
ENGR	Engineering
ENR	Environmental and Natural Resources
ENSP	Environmental Science and Policy
ENT	Entomology
ETOX	Environmental Toxicology
FDSC	Food Science
FIN	Finance
FNR	Forestry and Natural Resources
FOR	Forestry
FR	French
GC	Graphic Communications
GEN	Genetics
GEOG	Geography
GEOL	Geology
GER	German
GW	Great Works
HCG	Health Care Genetics
HEHD	Health, Education and Human Development
HIST	History
HLTH	Health
HON	Honors
HORT	Horticulture
HUM	Humanities
IE	Industrial Engineering
IPM	Integrated Pest Management
IS	International Studies
ITAL	Italian
JAPN	Japanese
JUST	Justice Studies
LANG	Language
LARC	Landscape Architecture
LATN	Latin
LAW	Law
LIB	Library
LIH	Language and International Health
LIT	Language and International Trade
LS	Leisure Skills
MATH	Mathematical Sciences
ME	Mechanical Engineering
MGT	Management
MICR	Microbiology
MKT	Marketing
ML	Military Leadership
MSE	Materials Science and Engineering
MUSC	Music
NPL	Nonprofit Leadership
NURS	Nursing
NUTR	Nutrition
PA	Performing Arts
PAS	Pan African Studies
PCPC	Pearce Center for Professional Communication
PES	Plant and Environmental Sciences
PHIL	Philosophy
PHSC	Physical Science
PHYS	Physics
PKSC	Packaging Science
PLPA	Plant Pathology
PORT	Portuguese
POSC	Political Science

PRTM	Parks, Recreation and Tourism Management
PSYC	Psychology
REL	Religion
RS	Rural Sociology
RUSS	Russian
SOC	Sociology
SPAN	Spanish
STAT	Experimental Statistics
STS	Science and Technology in Society
THEA	Theatre
WCIN	World Cinema
WFB	Wildlife and Fisheries Biology
WS	Women's Studies
YDP	Youth Development Program

ART AND ARCHITECTURAL HISTORY

Professor: W.W. Lew; Associate Professors: A.V. Feeser, J.B. LeBlanc; Assistant Professor: K. Kourelis

AAH 1010 Survey of Art and Architectural History I 3 (3) Comprehensive survey of art and architectural history of Western heritage as well as significant coverage of Asian, African, Native American, and South American art. The arts are studied within the contexts of history, geography, politics, religion, and culture. Survey includes Ancient through Gothic. Includes Honors sections.

AAH 1020 Survey of Art and Architectural History II 3 (3) Survey of Renaissance, Baroque, and Neoclassical art and architecture. Introduction to the Modern Movement in Europe and America. Includes Honors sections. *Prq:* AAH 1010.

AAH 2030 History and Theory of Architecture I 3 (3) First in a two-semester sequence of special topics and issues in the history of architecture. Emphasizes architectural theory and practice in the past and present. Includes analysis of differing approaches to history: chronological, typological, thematic, phenomenological. Includes Honors sections. *Prq:* AAH 1020.

AAH 2040 History and Theory of Architecture II 3 (3) Second of a two-semester sequence on special topics and issues in the history of architecture. Emphasizes typologies of the house, governmental buildings, and sacred architecture. Includes study of new directions in architectural historiography. Includes Honors sections. *Prq:* AAH 2030.

AAH 2050 History and Theory of Art I 3 (3) First of a two-semester sequence on special topics and issues in the history of art. Emphasizes stylistic developments and specific art movements. Analyzes art within the larger context of social, political, and religious history. Examines art techniques and theory as they have developed. Includes Honors sections. *Prq:* AAH 1020.

AAH 2060 History and Theory of Art II 3 (3) Second of a two-semester sequence on special topics and issues in the history of art. Continued emphasis on stylistic developments and art movements, with specific attention directed toward post-Renaissance art. Analyzes the influence of past history on modern. Includes Honors sections. *Prq:* AAH 2050.

AAH 3050 Contemporary Art History 3 (3) Study of contemporary art from World War II to the present, exploring forces that have shaped various movements and directions. *Prq:* AAH 2060.

AAH 3300 Honors Colloquium 3 (0) Undergraduate honors colloquium emphasizing interdisciplinary interpretations. Focuses on an integration of art, architecture, landscape, and city planning. *Preq:* AAH 2040 or AAH 2060.

AAH 3950 Special Topics in Visual Studies Abroad I 3 (3) On-site exposure to art and architecture in foreign countries, coupled with lectures and study problems. Different countries may be selected for study at faculty discretion. May be taught as a compact course during the academic year with a short stay in a foreign country or during summer with extended foreign experience. May not be taken Pass/No Pass. *Preq:* AAH 2040 or AAH 2060.

AAH 4110* Directed Research in Art History I 3 (3) Comprehensive studies and research of special topics not covered in other courses. Emphasis is on field studies, research activities, and current developments in art history.

AAH 4120* Directed Research in Art History II 3 (3) Continuation of AAH 4110.

AAH 4230* Studies in the Art and Architecture of the Renaissance I 3 (3) Consideration of the visual arts and architectural monuments of the Renaissance (Western Europe from the 15th–18th centuries), with a study in depth of selected examples from the period. *Preq:* AAH 2040 or AAH 2060.

AAH 4240* Studies in the Art and Architecture of the Renaissance II 3 (3) Consideration of the visual arts and architectural monuments of the Renaissance (Western Europe from the 15th–18th centuries), with a study in depth of selected examples from the period. *Preq:* AAH 4230.

AAH 4300* Twentieth Century Art I 3 (3) Acquaints students with the major artists' monuments and issues of the Modern period in art. Through lecture/discussions and the reading of primary sources, course places the major modern movements in the context of the period (1860's–1945). *Preq:* Consent of instructor.

AAH 4320* Twentieth Century Art II 3 (3) Overview of trends in art and architecture since World War II. Specific artists, artworks, and movements are presented in a socio/historic context with specific emphasis on the transition from a late-modernist to a post-modern perspective. *Preq:* Consent of instructor.

ACCOUNTING

Professors: D.M. Guffey, F.A. Kennedy; *Director:* J.J. McMillan, R.E. Welton Jr.; *Associate Professors:* C.W. Hollingsworth, L.F. Schleifer, S.K. Widener; *Assistant Professors:* D.W. Dalton, N.L. Harp, J.H. Irving, R.R. Radtke; *Lecturers:* J.R. Madray, S.V. Pearse

ACCT 2010 Financial Accounting Concepts 3 (3) Introduction to accounting principles with emphasis on the use of financial data and analysis of financial statements. Includes Honors sections.

ACCT 2020 Managerial Accounting Concepts 3 (3) Introduction to managerial accounting with emphasis on using accounting information to make decisions. Includes Honors sections.

ACCT 3030 Cost Accounting 3 (3) Application of cost analysis to manufacturing and distributing problems; analysis of behavior characteristics of business costs and a study of principles involved in standard cost systems; lectures and problems. Includes Honors sections. *Preq:* ACCT 2010 with a C or better.

ACCT 3110 Intermediate Financial Accounting I 3 (3) In-depth treatment of traditional financial accounting topics of standards setting, financial statement form and content, and accounting and reporting of current assets. Emphasizes basic theory, valuation, and measurement, as well as presentation and analysis of accounting information. Includes Honors sections. *Preq:* ACCT 2010 with a C or better.

ACCT 3120 Intermediate Financial Accounting II 3 (3) Continuation of ACCT 3110. In-depth treatment of accounting and reporting for non-current assets, current and noncurrent liabilities, and equity. Emphasizes basic theory, valuation, and measurement issues, as well as presentation and analysis of accounting information. Includes Honors sections. *Preq:* ACCT 3110 with a C or better.

ACCT 3130 Intermediate Financial Accounting III 3 (3) Continuation of ACCT 3120. In-depth treatment of selected accounting topics, such as investments, cash flows, tax allocation, post-retirement benefits, leases, and error corrections. Emphasizes basic theory, valuation, and measurement, as well as presentation and analysis of accounting information. Includes Honors sections. *Preq:* ACCT 3120 with a C or better.

ACCT 3220 Accounting Information Systems 3 (3) Study of computer-based accounting systems with attention to systems design, application, internal control, auditing the system, and system security. *Preq:* MGT 2180.

ACCT 3980 Creative Inquiry in Accounting 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. To be taken Pass/No Pass only.

ACCT 3990 Internship in Accounting 1-3 (1-3) Faculty-supervised accounting internship designed to give students learning opportunities that support their classroom experiences. Requires a minimum of six full-time weeks. Course enrollment and internship must occur in the same semester. Simultaneous credit cannot be received for another internship offering. May be repeated for a maximum of three credits. To be taken Pass/No Pass only. *Preq:* Junior standing and consent of instructor.

ACCT 4040* Individual Taxation 3 (3) Interpretation of Federal income tax laws, regulations, and court decisions with practice in application of these laws to the returns of individuals, partnerships, and corporations. Includes Honors sections. *Preq:* ACCT 3110 with a C or better.

ACCT 4060 Business Taxation 3 (3) Introduction to the importance of taxation in business decision making. Emphasizes the interrelationship of taxes, the choice of business form, and various business transactions; exposes students to the breadth of business decisions which are affected by the Federal Income Tax. *Preq:* ACCT 3110 with a C or better.

ACCT 4080 Retirement and Estate Planning 3 (3) Provides students with an understanding of the tax consequences of personal financial, retirement, and estate planning. Subjects include the basic concepts of retirement, gift, income shifting, and estate planning. *Preq:* ACCT 4040 with a C or better.

ACCT 4100* Contemporary Reporting and Management Control Systems 3 (3) Application of analyses and management control systems for contemporary business needs, including sustainability reporting, lean systems, capacity management, performance measures and incentive measures and incentive systems, and target costing. *Preq:* ACCT 3030 with a C or better.

ACCT 4150 Auditing 3 (3) Study of professional and practical auditing theory. Includes a review of internal controls, audit procedures, and development of audit programs for various types of businesses. Considers auditors' professional and ethical standards. *Preq:* ACCT 3110 and ACCT 3220, each with a C or better.

AGRICULTURAL EDUCATION

Professor: T.R. Dobbins; *Associate Professors:* P.M. Fravel, K.D. Layfield

AGED 1000 Orientation and Field Experience 1 (2) Supervised observations and explanations of vocational agriculture teaching while serving as teacher aides. One full week of field experience in representative high schools is required.

AGED 1020 Agricultural Education Freshman Seminar 1 (2) Introduces students to the South Carolina agriculture education structure and provides opportunities to prepare oral presentations on selected agricultural education organizations. Assists students in understanding the value of professional organizations to agriculture education in the state and nation. *Preq:* Agricultural Education major.

AGED 2000 Agricultural Applications of Educational Technology 3 (2) Overview of microcomputer hardware and software encompassing word processing, spreadsheet, utility, Web development, and graphic communications in an agricultural context. *Coreq:* AGED 2001.

AGED 2001 Agricultural Applications of Educational Technology Laboratory 0 (2) Non-credit laboratory to accompany AGED 2000. *Coreq:* AGED 2000.

AGED 2010 Introduction to Agricultural Education 3 (2) Principles of education, development of agricultural education, and an introduction to the formulation of instructional programs for the teaching of agricultural courses. *Coreq:* AGED 2011.

AGED 2011 Introduction to Agricultural Education Laboratory 0 (3) Non-credit laboratory to accompany AGED 2010. *Coreq:* AGED 2010.

- AGED 2020 Agricultural Education Sophomore Seminar 1 (2)** Instruction on how to establish a comprehensive student record-keeping system. Includes integration of that data into the FFA Awards program. Allows students hands-on experience with the total FFA Awards program on the state and national level. *Preq:* AGED 1020.
- AGED 2030 Teaching Agriscience 3 (2)** Integrates biological and technological concepts appropriate for teaching introductory middle or secondary school-level courses in agricultural science. Topics emphasize disciplines, theories, and applications in modern agricultural production. Experiences include teaching techniques, materials, resources, and the design and implementation of new activities to facilitate teaching agriscience. *Preq:* BIOL 1040 and BIOL 1060. *Coreq:* AGED 2031.
- AGED 2031 Teaching Agriscience Laboratory 0 (3)** Non-credit laboratory to accompany AGED 2030. *Coreq:* AGED 2030.
- AGED 2040 Applied Agriculture Calculations 3 (3)** Demonstrates basic mathematical applications in crop and livestock production and agribusiness and financial management. These applications aid students in understanding the mathematical applications needed in the agriculture field.
- AGED 3020 Agricultural Education Junior Seminar 1 (2)** Allows students the opportunity to prepare and deliver information on Career Development Events (CDE) and to understand fully the CDE concepts. Students receive much needed hands-on experience at the state and national levels. *Preq:* AGED 2020.
- AGED 3030 Mechanical Technology for Agriculture Education 3 (2)** Study of technical content and new technology utilized in agriculture mechanics. Integrates agriculture mechanics topics such as electrical wiring and controls, green industry maintenance, irrigation systems, and agriculture construction. Offers a delivery of mechanics instruction in the classroom and laboratory setting. *Coreq:* AGED 3031.
- AGED 3031 Mechanical Technology for Agriculture Education Laboratory 0 (3)** Non-credit laboratory to accompany AGED 3030. *Coreq:* AGED 3030.
- AGED 3550 Team and Organizational Leadership in the Food and Fiber System 3 (3)** Principles and practices in planning, developing, conducting, and evaluating leadership programs for agricultural groups. Focuses on helping students better understand themselves and others; improving group communications; becoming effective leaders and members of groups; improving leadership and personal development skills; assessing leadership situations, determining and administering appropriate leadership strategies.
- AGED 3650 Multiculturalism in Agricultural Education 3 (3)** Investigation of the cultures (both domestic and foreign) commonly encountered by agriculture education professionals. Customs, traditions, beliefs, stereotypes, and myths are explored. Strategies for relationship building, impact, and successful interaction are developed for formal and informal agricultural learning environments. *Preq:* Junior standing.
- AGED 4000 Supervised Field Experience II 1 (3)** Special emphasis is placed on enhancing existing knowledge and experiences of the students. Primary focus is on becoming acquainted with the student teaching center well in advance of the customary twelve-week directed teaching experience.
- AGED 4010* Instructional Methods in Agricultural Education 3 (2)** Appropriate methods of teaching vocational agriculture in high schools. Includes procedures for organizing teaching programs, teaching high school students, and directing FFA activities. *Coreq:* AGED 4011.
- AGED 4011* Instructional Methods in Agricultural Education Laboratory 0 (3)** Non-credit laboratory to accompany AGED 4010. *Coreq:* AGED 4010.
- AGED 4020 Agricultural Education Senior Seminar 1 (2)** Provides an opportunity to prepare and deliver information on continuing adult education. Assists students in fully understanding the adult education component of the total Secondary Agriculture Education Program. *Preq:* AGED 3020.
- AGED 4030* Principles of Adult/Extension Education 3 (3)** Overview of adult/extension education and adult learning. Selection of adult education providers is reviewed with emphasis on extension. *Preq:* Junior standing.
- AGED 4060 Directed Teaching 12 (36)** Guided participation in the professional responsibilities of a teacher of vocational agriculture, including intensive study of the problems encountered and competencies developed. Twelve weeks of directed teaching in selected schools are required. *Preq:* AGED 4000 and AGED 4010.
- AGED 4070 Internship in Extension and Leadership Education 6-12 (6-12)** Internship placements may include county extension offices and other appropriate extension units. Six weeks of supervised experience must be completed for six hours of credit. Twelve weeks of supervised experience must be completed for 12 hours of credit. May be repeated for a maximum of 12 credits. *Preq:* AGED 4000 and AGED 4010 and Senior standing.
- AGED 4120 Senior Agriculture Leadership Seminar 1 (2)** Emphasizes leadership techniques and policies that affect agriculture. Students conduct research and make presentations on issues which influence agriculture policy. *Preq:* AGRB 3020; and one of AGRB 2020 or ECON 2000 or ECON 2110.
- AGED 4150* Leadership of Volunteers 3 (3)** Provides an overview of volunteer management. Examines the knowledge, skills, and abilities required of professional managers to involve volunteers effectively in the work of organizations.
- AGED 4160* Ethics and Issues in Agriculture and the Food and Fiber System 3 (3)** Explores ethical theories, concepts of critical thinking, and major ethical issues in American agriculture. The major social, political, economic, and ethical issues that arise in connection to the food and fiber system are examined and potential solutions considered.
- AGED 4230* Curriculum 3 (3)** Curriculum goals and related planning for career and continuing education programs.
- AGED 4250* Teaching Agricultural Mechanics 2 (1)** Instruction in organizing course content, conducting and managing an agricultural mechanics laboratory, shop safety, microteaching demonstrations of psychomotor skills, and methods of teaching manipulative abilities. *Coreq:* AGED 4251.
- AGED 4251* Teaching Agricultural Mechanics Laboratory 0 (3)** Non-credit laboratory to accompany AGED 4250. *Coreq:* AGED 4250.
- AGED 4280* Special Studies in Agricultural Education 1-3 (1-3)** Students study, individually or collectively, selected topics and/or problems in agricultural education to meet the particular needs of the clientele enrolled. May be repeated for a maximum of six credits.
- AGED 4400 Program Development in Adult/Extension Education 3 (3)** Principles, theory, and practice in planning and conducting educational programs in adult/extension settings. *Preq:* Junior standing.
- AGED 4500* Modern Topics and Issues 3 (3)** Students select a major area of concern to teachers of agriculture and county agents for intensive study at least one semester prior to offering the course. When feasible, team teaching with faculty from other departments in the College of Agriculture, Forestry and Life Sciences is utilized. *Preq:* Senior standing.
- AGED 4800* Foundations of Digital Media and Learning 3 (2)** Critical use of digital media for leadership and learning within societal and educational contexts. Course focuses on learner impact while exploring, developing, and evaluating technology-enhanced applications. Further develops competencies with new media literacies and addresses societal, cultural, ethical, and participatory issues and uses of digital media. *Coreq:* AGED 4801.
- AGED 4801* Foundations of Digital Media and Learning Laboratory 0 (2)** Non-credit laboratory to accompany AGED 4800. *Coreq:* AGED 4800.
- AGED 4810* Web Design for the Life Sciences and Agriculture 3 (2)** Addresses basic principles and theories of Web design and site construction, including usability and accessibility considerations. Web and graphics design software are used to develop sites suitable for life science and agricultural organizations. Service-learning is used with student projects. *Preq:* AGED 2000 and CPSC 1200. *Coreq:* AGED 4811.
- AGED 4811* Web Design for the Life Sciences and Agriculture Laboratory 0 (2)** Non-credit laboratory to accompany AGED 4810. *Coreq:* AGED 4810.
- AGED 4820* Advanced Educational Applications of Microcomputers 3 (2)** Provides students with the knowledge and skills needed to apply microcomputer technology to the utilization and generation of educational software in accordance with sound educational principles. *Preq:* AGED 4800 or EDF 4800. *Coreq:* AGED 4821.
- AGED 4821* Advanced Educational Applications of Microcomputers Laboratory 0 (2)** Non-credit laboratory to accompany AGED 4820. *Coreq:* AGED 4820.

AGRICULTURAL MECHANIZATION

Professors: J.P. Chastain, Y.J. Han, A. Khalilian;
Associate Professors: A. Jayakaran, C.V. Privette, III;
Assistant Professors: D.R. Hitchcock, K.R. Kirk, C.B. Sawyer; *Lecturer:* H. Massey

- AGM 1010 Introduction to Agricultural Mechanization and Business 1 (3)** Introduces the Agricultural Mechanization and Business program. Gives an overview of the curriculum, introduces students to relevant extracurricular activities, exposes students to employment opportunities through alumni and interns, and helps students to prepare for careers relevant to the major.
- AGM 2050 Principles of Fabrication 3 (2)** Principles, techniques, and methods in the selection, proper use, and maintenance of hand and power tools. Principal topics include welding, tool fitting, metalworking, woodworking, finishing and preserving, and heat treatment. *Coreq:* AGM 2051.
- AGM 2051 Principles of Fabrication Laboratory 0 (3)** Non-credit laboratory to accompany AGM 2050. *Coreq:* AGM 2050.
- AGM 2060 Machinery Management 3 (2)** Teaches agriculture students to apply physical principles and sound reasoning to the mechanization of modern agricultural production and processing enterprises. Stresses planning efficient operational systems and wise selection of equipment, based on function and economic suitability. *Preq or concurrent enrollment:* MATH 1020 or MATH 1060; and PHYS 2000 or PHYS 2070. *Coreq:* AGM 2061.
- AGM 2061 Machinery Management Laboratory 0 (3)** Non-credit laboratory to accompany AGM 2060. *Coreq:* AGM 2060.
- AGM 2190 Agribusiness and Food Systems 3 (3)** Provides a general introduction to the major activities associated with the movement of agricultural and food products from producers to processors to consumers and the essential supply chain functions of buying, selling, transportation, storage, financing, standardization, pricing and risk bearing.
- AGM 2210 Surveying: Earthwork and Area Measurements 3 (2)** Fundamentals of surveying relative to earthwork and land area measurements, including linear measurements, leveling, angular measurements, and computations. Levels and total stations are used with an introduction to GPS. *Preq or concurrent enrollment:* MATH 1020 or MATH 1060. *Coreq:* AGM 2211.
- AGM 2211 Surveying: Earthwork and Area Measurements Laboratory 0 (3)** Non-credit laboratory to accompany AGM 2210. *Coreq:* AGM 2210.
- AGM 3010 Soil and Water Conservation 3 (3)** Soil and water management is studied by applying principles of mathematics, fluid flow, hydrology, and soil characteristics as related to soil-water-vegetation complexes in runoff, erosion control, channel design, water conservation, drainage, irrigation, stormwater best management practices and stream restoration. *Preq or concurrent enrollment:* MATH 1020 or MATH 1060.
- AGM 3030 Calculations for Mechanized Agriculture 3 (2)** Enhances students' ability to analyze and solve a wide range of problems requiring engineering technology. Laboratory periods introduce students to microcomputer hardware. Basic programming and typical applications to agricultural mechanization problems are included. *Preq or concurrent enrollment:* PHYS 2000 or PHYS 2070. *Coreq:* AGM 3031.
- AGM 3031 Calculations for Mechanized Agriculture Laboratory 0 (3)** Non-credit laboratory to accompany AGM 3030. *Coreq:* AGM 3030.
- AGM 3190 Agribusiness Decision Analysis 3 (3)** Improvement of the decision-making process in agricultural businesses through the use of decision-analysis software. Students build their own decision-making models using spreadsheets. *Preq:* AGM 2190 or AGRB 3020 or AGRB 3190 or MGT 2010.
- AGM 3710 Agricultural Mechanization Practicum 1-3 (1-3)** Pre-planned internship with an approved employer involved in agricultural technical or business endeavors. 130 hours of supervised responsibility are required per credit hour. A work journal, written/oral reports, company consent and evaluation must be on file. May be repeated for a maximum of twelve credits. To be taken Pass/No Pass only.
- AGM 4000 Senior Seminar in Agricultural Mechanization and Business 1 (1)** Seminar and project-based course providing information on a variety of topics of value for the development of professionals in agricultural mechanization and business and in agricultural education. Topics include development of a professional resume, professional ethics, and current topics related to agricultural technology and systems management. *Preq:* Junior or senior standing in Agricultural Mechanization and Business or in Agricultural Education.
- AGM 4020* Landscape Drainage and Irrigation 3 (2)** Uses basic soil-water-plant relationships to determine the need for and methods of irrigation and drainage. Topics include irrigation methods, drainage needs and drainage methods. *Preq or concurrent enrollment:* AGM 3010. *Coreq:* AGM 4021.
- AGM 4021* Landscape Drainage and Irrigation Laboratory 0 (3)** Non-credit laboratory to accompany AGM 4020. *Coreq:* AGM 4020.
- AGM 4050* Environmental Control in Animal Structures 3 (2)** Design of environmental control systems for animal production facilities. Topics include effects of the thermal and chemical environment on animals, ventilation system design, thermal design of structural envelopes, design of heating, cooling, and lighting systems. Emphasis is on practical, energy-efficient applications to modern animal production facilities. *Preq:* AGM 3030 or AVS 3010. *Coreq:* AGM 4051.
- AGM 4051* Environmental Control in Animal Structures Laboratory 0 (3)** Non-credit laboratory to accompany AGM 4050. *Coreq:* AGM 4050.
- AGM 4060* Mechanical and Hydraulic Systems 3 (2)** Study of power transmission systems for agricultural production emphasizing mobile equipment. Characteristics, requirements, and design of both V-belt drive and roller-chain drives are presented. Emphasizes hydraulic power transmission systems, including pumps, actuators, control devices, and hydraulic circuitry. *Preq:* AGM 2060; and PHYS 2000 or PHYS 2070. *Coreq:* 4061.
- AGM 4061* Mechanical and Hydraulic Systems Laboratory 0 (3)** Non-credit laboratory to accompany AGM 4060. *Coreq:* AGM 4060.
- AGM 4100* Precision Agriculture Technology 3 (2)** Includes principles and hands-on application of technologies supporting precision agriculture. Topics include global positioning system (GPS), geographic information system software, variable rate technologies, collection of spatial data, automated guidance of equipment, spatial data mapping and analysis, remote sensing, and economic considerations. *Preq:* Junior standing. *Coreq:* AGM 4101.
- AGM 4101* Precision Agriculture Technology Laboratory 0 (3)** Non-credit laboratory to accompany AGM 4100. *Coreq:* AGM 4100.
- AGM (ELE) 4190 Agribusiness Innovation and Entrepreneurship 3 (3)** Emphasis on assessing students' abilities as agribusiness entrepreneurs, evaluating the feasibility of a business idea, creating strategies for organizing and marketing the agricultural business, exploring pricing for products or services, developing capital needs and sound financial statements, and researching, developing, and writing a comprehensive plan for the business. May also be offered as ELE 4190. *Preq:* AGM 2190 or AGM 3190 or AGRB 3020 or AGRB 3190 or MGT 2010.
- AGM 4520* Mobile Power 3 (2)** Study of tractors, emphasizing internal combustion engines and support systems necessary for their proper functioning. Also considers application of power, maintenance, adjustment, and general repair. *Preq:* PHYS 2000 or PHYS 2070. *Coreq:* AGM 4521.
- AGM 4521* Mobile Power Laboratory 0 (3)** Non-credit laboratory to accompany AGM 4520. *Coreq:* AGM 4520.
- AGM 4600* Electrical Systems 3 (2)** Students in agriculture and related curricula study electric and other utilities on the farm and in the home. Emphasizes selection, installation, and maintenance of wiring systems, lighting systems, motors, controls, water systems, and waste disposal systems. *Preq:* Junior standing. *Coreq:* AGM 4601.
- AGM 4601* Electrical Systems Laboratory 0 (3)** Non-credit laboratory to accompany AGM 4600. *Coreq:* AGM 4600.
- AGM 4720 Capstone 3 (2)** Covers professional conduct, ethics, oral and written communication, and financial matters. Each student completes a comprehensive project on a technical subject. The results are given in a written report and oral presentation. Students use digital portfolio technology to assess their education. *Coreq:* AGM 4721.
- AGM 4721 Capstone Laboratory 0 (3)** Non-credit laboratory to accompany AGM 4720. *Coreq:* AGM 4720.

AGM 4730 Special Topics in Agricultural Mechanization 1-3 (1-3) Comprehensive study and application of new technologies and methods not covered in existing courses. Emphasizes independent study using innovative approaches to problem solving. May be repeated for a maximum of six credits.

AGRIBUSINESS

Professor: W.M. Smathers Jr.; Associate Professors: R.D. Lamie, D.B. Willis; Assistant Professors: Y.V. Bolotova, M. Vassalos

AGRB 2020 Agricultural Economics 3 (3) Analytical survey of the various subdivisions of agricultural economics, including farm organization, enterprise, land economics, marketing, farm prices, governmental farm policies, and the relation of agriculture to the national and international economy.

AGRB 2050 Agriculture and Society 3 (3) Introduction to the development of world society focusing on food production, from early hunting and gathering to modern biotechnology. Covers factors driving societal growth with a global perspective. Explores systematic impacts of growth in technical capacity to produce agricultural products on farm and community organization, industrialization, and the global economy.

AGRB 2570 Natural Resources, Environment and Economics 3 (3) Economic principles applied to resource allocation problems related to environmental and natural resource issues.

AGRB 3020 Economics of Farm Management 3 (3) Economic principles underlying the organization and operation of agricultural firms and related business enterprises. Particular emphasis is placed on management aspects of the farm as a production unit. *Preq: AGRB 2020 or ECON 2110.*

AGRB 3090 Economics of Agricultural Marketing 3 (3) General course in marketing agricultural commodities with particular emphasis upon food products. Analyzes efficiency criteria, consumer behavior, market organizations and institutions, and marketing functions. Includes Honors sections. *Preq: AGRB 2020 or ECON 2000 or ECON 2110.*

AGRB 3130 Principles of Real Estate Appraisal 3 (3) Introduction to basic principles and procedures of real estate appraisal. Topics include the real estate market, principles of valuation, legal concepts, and the application of the comparable sales, cost, and income approaches to real estate valuation. *Preq: FIN 3070.*

AGRB 3190 Agribusiness Management 3 (3) Study of the principles used in making management decisions and the application of these principles in agribusiness. Emphasizes the application of economics to the solution of problems facing managers of agricultural supply and marketing firms. *Preq: AGRB 3020.*

AGRB 3510 Principles of Advertising 3 (3) Introduction to the various functions of advertising; research and audience analysis; various media formats; planning, research, and production necessary to create an advertising campaign; social effects, economic effects, and ethical considerations of advertising.

AGRB 3520 Public Finance 3 (3) Principles of financing government, sources of public revenue, objects of public expenditures, problems of fiscal administration, and the application of fiscal policies in stabilizing the national economy. *Preq: Junior standing.*

AGRB 3570 Natural Resources Economics 3 (3) Principles and problems involved in the use of soil, water, forest, and mineral resources, with special emphasis on economic aspects of alternative methods of resource utilization. *Preq: AGRB 2020 or ECON 2000 or ECON 2110.*

AGRB (HLTH) 3610 Introduction to Health Care Economics 3 (3) Introductory course in which students learn the basic economics of the institutions comprising the health-care industry. Topics include the underlying supply, demand, and institutional factors impacting health-care availability and cost of health care. May also be offered as HLTH 3610.

AGRB 4020* Production Economics 3 (3) Economic analysis of agricultural production involving the concept of the farm as a firm; principles for decision making; the quantitative nature and use of production and cost functions and the interrelations and applications of these principles to resource allocation in farms and among areas. *Preq: AGRB 3080; and ECON 3060 or ECON 3140.*

AGRB 4080 Quantitative Applied Economics 3 (3) Regression analysis, linear programming, and risk efficiency analysis techniques are presented and applied to agribusiness firms to improve firm economic efficiency. Microcomputer optimization and statistical software packages are utilized to develop firm level strategic plan to achieve efficient agribusiness outcomes in uncertain economic environments. *Preq: STAT 2300.*

AGRB 4090 Commodity Futures Markets 3 (3) Introduction to the economic theory, organization, and operating principles of agricultural commodity futures markets in the United States. Emphasizes speculating, hedging, and investing in agricultural commodity futures contracts from the standpoint of the agribusiness entrepreneur. *Preq: AGRB 2020 or ECON 2110.*

AGRB 4110* Regional Impact Analysis 3 (3) Techniques for analysis of the growth and decline of regions, including economic-base theory, shift share, regional input-output, regional econometric models, and fixed impact models. *Preq: AGRB 2020; or both ECON 2110 and ECON 2120.*

AGRB 4120* Regional Economic Development Theory and Policy 3 (3) Development of rural economic activity in the context of historical, theoretical, and policy aspects of friction associated with spatial separation. Considers location factors, transfer costs, location patterns, and regional-growth policy. *Preq: AGRB 2020 or ECON 2110.*

AGRB 4130* Advanced Real Estate Appraisal 3 (3) Topics include highest and best use analysis, data collection, and analyses. Stresses advanced appraisal procedures for income, cost, and comparable sales approach to real estate valuation. Covers eminent domain, the appraisal of property in transition, and specialized property. *Preq: AGRB 3130 or FIN 3070.*

AGRB 4210* Globalization 3 (3) Utilizes basic principles of international economics (comparative advantage, free trade versus protectionism, exchange rate determination, etc.) to analyze the contemporary problems and issues of the world economy. Emphasizes application of economic principles to current globalization trends. *Preq: AGRB 2020 or ECON 2000 or ECON 2110.*

AGRB (PES) 4260* Cropping Systems Analysis 3 (2) Application of agronomic and economic principles in solving problems related to the production and marketing of agronomic crops. Major part of the course is a case study in which detailed analysis of a farm, agribusiness, or environmental situation is made with students making formal written and oral presentations of results. May also be offered as PES 4260. *Preq: PES 1040; and Junior standing; and AGRB 2020 or ECON 2000 or ECON 2110. Coreq: AGRB 4261.*

AGRB (PES) 4261* Cropping Systems Analysis Laboratory 0 (1) Non-credit laboratory to accompany AGRB 4260. May also be offered as PES 4261. *Coreq: AGRB 4260.*

AGRB 4520* Agricultural Policy 3 (3) Review of public agricultural policy programs in the United States and a critical examination of current and proposed government policies and programs affecting the agricultural sector of the economy. Includes economic considerations as related to past and current farm price and income problems. Includes Honors sections. *Preq: AGRB 2020 or ECON 2000 or ECON 2110.*

AGRB 4560* Prices 3 (3) Review of the basic theory of price under competitive conditions and various modifications; nature, measurement, and causes of daily, seasonal, and cyclical price fluctuations; geographical price relationships; nature, function, and behavior of futures markets; government price programs. Includes Honors sections. *Preq: AGRB 3080 or ECON 4050; and ECON 3060 or ECON 3140.*

AGRB (ECON) 4570* Natural Resource Use, Technology and Policy 3 (3) Focuses on economic analyses of actual, efficient, and sustainable uses of natural resources, impacts of technologies that affect these uses, and policies that affect development and use of such technologies. Resource-technology-policy combinations may vary, but an example is crude oil, hybrid automotive engines, and fuel economy standards. May also be offered as ECON 4570. *Preq: MATH 1020 or MATH 1060; and AGRB 3570 or ECON 3140.*

AGRB 4600* Agricultural Finance 3 (3) Study of the principles and technique of financing in the agricultural sector. Topics include the capital situation in agriculture, concepts of farm financial management, use of credit, capital markets, lending agencies, and estate planning. *Preq: ACCT 2010; and AGRB 2020 or ECON 2000 or ECON 2110.*

AGRB (WFB) 4750* Economics of Wildlife Management and Policy 3 (3) Integrated approach to the study of the economics of wildlife. Topics include determination of market and nonmarket value, single and multiple species management, enterprise cost and returns, marketing wildlife, leasing methods, complementarity and competitiveness with agricultural and forestry enterprises, and timber and crop damage cost estimates and control. May also be offered as WFB 4750. *Preq:* AGRB 2020 or ECON 2000 or ECON 2110 or FOR 3040 or WFB 3060.

AGRB 4900 Selected Topics 1-15 (1-15) Study of topics in applied economics. Topics may include classroom and/or field experience not normally covered in other classes. May be repeated for credit, but only if different topics are covered. *Preq:* Junior standing.

AGRB 4910 Internship, Agribusiness, and Community and Rural Development 1-6 (1-6) Internship under faculty supervision in an approved agency or firm. Internships provide students with work experience in agribusiness or community and rural development. Students submit a comprehensive report within one week of the end of the internship. A maximum of six internship credits may be earned. *Preq:* Junior standing and consent of instructor.

AGRB 4940 Creative Inquiry: Community and Rural Development 1-3 (1-3) Multi-semester commitment to participate in agricultural and applied economics and community and economic development related research experience for students working in teams, mentored and directed by a faculty member. Students learn to collect, analyze, evaluate, and present information. Suitable for inclusion in the students e-portfolio. May be repeated for a maximum of 12 credits. *Preq:* Consent of instructor.

ATHLETIC LEADERSHIP

Lecturer: D. J. Cadorette

AL 3490 Principles of Coaching 3 (3) Investigation into the scientific basis of the coaching profession, middle and high school levels. Topics include developing a coaching philosophy, sport psychology, sport pedagogy, sport physiology, athletic administration, and risk management. Current issues regarding sportsmanship, gender equity compliance, and cultural diversity are researched and synthesized. *Preq:* Athletic Leadership minor. (Non-minors with junior or higher standing and a minimum GPA of 2.3 may request an override to register for this course.)

AL 3500 Scientific Basis of Coaching I: Exercise Physiology 3 (3) Increases understanding of basic scientific information concerning athletic performance by using the conceptual approach. Focuses primarily on an in-depth investigation into the physiological principles that can enhance athletic performance. Includes phases of physical training as well as comprehensive evaluative techniques. *Preq or concurrent enrollment:* AL 3490 or AL 3520 or BIOL 2200 or BIOL 2230.

AL 3510 CPR/AED for Athletic Coaches 1 (2) In this course, those with a duty to act learn the skills needed to respond appropriately to cardiac and breathing emergencies. Each participant learns to become a more responsible coach and when and how to safely return an athlete to play. Students also learn to use an Automated External Defibrillator (AED) to care for victims of cardiac arrest, and receive American Red Cross CPR certification in the context of sport safety training as outlined in the National Standards for Sport Coaches.

AL 3520 Scientific Basis of Coaching II: Kinesiology 3 (3) Increases understanding of basic scientific information concerning athletic movement by utilizing the conceptual approach. Deals with the basic laws of human motion necessary in evaluation of athletic movement, utilizing joint structure and anatomic landmarks as a basis for motion. *Preq or concurrent enrollment:* AL 3530 or AL 3500 or BIOL 2200 or BIOL 2230.

AL 3530 Theory of Prevention and Treatment of Athletic Injuries 3 (2) Increases understanding of principles involved in the prevention and treatment of athletic injuries. Deals with basic anatomy, first aid, and diagnostic techniques necessary for the understanding of basic athletic training procedures. *Preq or concurrent enrollment:* AL 3490 or BIOL 2200 or BIOL 2230 or ED 3220 or LS 2750 or LS 2760 or LS 2770 or PRTM 3510. *Coreq:* AL 3531.

AL 3531 Theory of Prevention and Treatment of Athletic Injuries Laboratory 0 (3) Non-credit laboratory to accompany AL 3530. *Coreq:* AL 3530.

AL 3600 High School Athletics Ethical and Legal Issues 3 (3) Investigates ethical and legal issues specific to high school athletic program administration as identified by the National Interscholastic Athletic Administrators Association (NIAAA) Leadership Program and addressed by the National Association for Sport and P.E. (NASPE) National Standards for Sport Coaches. *Preq:* Completion of or concurrent enrollment in AL 3490; or junior standing with a minimum GPA of 2.3.

AL 3610 Administration and Organization of Athletic Programs 3 (3) Study of modern techniques and practices used in administering athletic programs. Emphasizes areas such as practice and game organization, purchase and care of equipment, budget and finances, public relations, and legal liability in athletic programs. *Preq or concurrent enrollment:* AL 3490 or PRTM 2230 or PRTM 2240.

AL 3620 Psychology of Coaching 3 (3) Study of psychological techniques utilized to promote maximum athletic performance. Emphasizes motivation, coaching philosophy, athletic personality, mental preparation, and goal-oriented behavior. *Preq or concurrent enrollment:* AL 3490 or PSYC 2010.

AL 3710 Coaching Baseball 1 (3) Increases understanding of basic technical and practical information concerning the coaching of baseball by utilizing the conceptual approach. Students study basic principles of coaching, competitive organization, and proper technical skills needed to improve athletic performances. Also covers total program development as it pertains to specific levels of competition. *Preq:* Completion of or concurrent enrollment in AL 3490; or junior standing with a minimum GPA of 2.3.

AL 3720 Coaching Basketball 1 (3) Increases understanding of basic technical and practical information concerning the coaching of basketball by utilizing the conceptual approach. Students study basic principles of coaching, competitive organization, and proper technical skills needed to improve athletic performances. Also covers total program development as it pertains to specific levels of competition. *Preq:* Completion of or concurrent enrollment in AL 3490; or junior standing with a minimum GPA of 2.3.

AL 3730 Coaching Cross Country 1 (3) Increases understanding of technical and practical information concerning the coaching of cross country by utilizing the conceptual approach. Students study basic principles of coaching, competitive organization, and proper technical skills needed to improve athletic performances. Also covers total program development as it pertains to specific levels of competition. *Preq:* Completion of or concurrent enrollment in AL 3490; or junior standing with a minimum GPA of 2.3.

AL 3740 Coaching Football 1 (3) Increases understanding of basic technical and practical information concerning the coaching of football by utilizing the conceptual approach. Students study basic principles of coaching, competitive organization, and proper technical skills needed to improve athletic performances. Also covers total program development as it pertains to specific levels of competition. *Preq:* Completion of or concurrent enrollment in AL 3490; or junior standing with a minimum GPA of 2.3.

AL 3750 Coaching Soccer 1 (3) Increases understanding of basic technical and practical information concerning the coaching of soccer by utilizing the conceptual approach. Students study basic principles of coaching, competitive organization, and proper technical skills needed to improve athletic performances. Also covers total program development as it pertains to specific levels of competition. *Preq:* Completion of or concurrent enrollment in AL 3490; or junior standing with a minimum GPA of 2.3.

AL 3760 Coaching Strength and Conditioning 1 (3) Increases understanding of basic technical and practical information concerning the coaching of strength and conditioning by utilizing the conceptual approach. Students study basic principles of coaching, training programs, and equipment appraisal as a means to improve athletic performance. Also covers total program development as it pertains to specific levels of competition. *Preq:* Completion of or concurrent enrollment in AL 3490; or junior standing with a minimum GPA of 2.3.

AL 3770 Coaching Track and Field 1 (3) Increases understanding of basic technical and practical information concerning the coaching of track and field by utilizing the conceptual approach. Students study basic principles of coaching, competitive organization, and proper technical skills needed to improve athletic performances. Also covers total program development as it pertains to specific levels of competition. *Preq:* Completion of or concurrent enrollment in AL 3490; or junior standing with a minimum GPA of 2.3.

AL 4000 Athletic Leadership Internship 0 (3) Athletic coaching and administration internship for a minimum of 60 hours. To be taken concurrently with any other Clemson University course. To be taken Pass/No Pass only. Students must have current CPR certification. *Preq:* Consent of Athletic Leadership coordinator.

AL 4380 Selected Topics in Athletic Leadership 1-3 (1-3) Specific athletic leadership topics not found in other courses are selected for in-depth study. May be repeated for a maximum of nine credits, but only if different topics are covered.

AL 4390 Independent Study in Athletic Leadership 1-3 (1-3) Independent study in athletic leadership under the direction of an athletic leadership faculty member. Student and faculty member develop a course of study different from any existing courses and designed for the individual student to enhance leadership skills in athletics. May be repeated for a maximum of nine credits with different course topics.

AL 4530 Athletic Injuries: Prevention, Assessment and Rehabilitation 3 (3) Gives students an understanding of prevention, treatment, and rehabilitation procedures of injured athletes. *Preq:* Completion of or concurrent enrollment in AL 3490; or junior standing with a minimum GPA of 2.3.

ANTHROPOLOGY

Professor: J.M. Coggeshall; *Associate Professors:* M.A. Vogel, K.E. Weisensee, Y. Zhang; *Assistant Professor:* Y. Wu; *Adjunct Assistant Professor:* L.G. Rapaport

ANTH 2010 Introduction to Anthropology 3 (3) Offers a four-field overview: primates and human biological origins; the development of agriculture and complex societies in the archaeological record; contemporary human societies cross-culturally; and the relationship between languages and cultures. An anthropological perspective on contemporary human problems is also presented. Includes Honors sections.

ANTH 2050 Professional Development 2 (2) Explores anthropology as a profession and examines the opportunities associated with an Anthropology major at Clemson University. Focus is on preparation for a range of careers related to anthropology and the resources and skills that contribute to professional success. *Preq:* ANTH 2010 and Anthropology major.

ANTH 3010 Cultural Anthropology 3 (3) Explores human cultural diversity and current global issues. Examines food production and economic distribution, political organization, marriage and family, and religious systems in contemporary cultures. *Preq:* ANTH 2010.

ANTH 3200 North American Indian Cultures 3 (3) Discusses the prehistory of Native peoples, their cultural diversity at European contact, and the history and impact of that contact. Also examines contemporary issues facing Native Americans. *Preq:* ANTH 2010.

ANTH 3310 Archaeology 4 (3) Overview of anthropological archaeology emphasizing the scientific analyses, methodologies and theoretical approaches used by anthropological archaeologists to study the human past. Students learn about the origins and development of complex society and explore individual case studies. *Coreq:* ANTH 3311.

ANTH 3311 Archaeology Laboratory 0 (2) Non-credit laboratory to accompany ANTH 3310. *Coreq:* ANTH 3310.

ANTH 3320 World Archaeology 3 (3) Global survey of the earliest complex societies focusing on the origins of pristine states from the perspective of anthropological archaeology. Following a brief overview of archaeological methods and approaches, students learn about the origins of complex societies of Mesopotamia, the Indus Valley, Egypt, China, Mesoamerica, and the Andes.

ANTH (BIOL) 3510 Biological Anthropology 3 (3) Study of humans as biological organisms. Examines human evolution, primate social behavior, human physiological variations and disease resistance, and human skeletal anatomy and forensics. May also be offered as BIOL 3510. *Preq:* ANTH 2010 or BIOL 1100.

ANTH (BIOL) 3530 Forensic Anthropology 3 (3) Introduction to forensic anthropology, the science that utilizes methods from skeletal biology and archaeology as tools in human identification in a medico-legal context. May also be offered as BIOL 3530. *Preq:* Junior standing.

ANTH (LANG) 3710 Language and Culture 3 (3) Surveys key topics, theories, and methodological approaches in linguistic anthropology. Examines the complex relationships among language, culture, and communicative behavior and provides students with conceptual tools that inform the study of language in its cultural contexts. May also be offered as LANG 3710.

ANTH 4030* Qualitative Methods 3 (3) Methods and techniques of qualitative field research, including participant observation, ethnographic interviewing, data analysis, and report writing. *Preq:* ANTH 2010.

ANTH 4040 Anthropological Theories 3 (3) Examines various anthropological theories and their utility in explaining contemporary global issues. Students read, discuss and compare original theoretical works, and synthesize ideas through class writings and debates. Course is offered every other year.

ANTH (JAPN) 4170 Japanese Culture and Society 3 (3) Focuses on basic themes in Japanese culture found in social interaction and ritual behavior. Japanese social organization, including marriage and family patterns, neighborhood and community organization, and gender roles receive extensive attention. All readings and discussions are in English. May not be used to satisfy general foreign language requirements. May also be offered as JAPN 4170.

ANTH (CHIN) 4180 Chinese Culture and Society 3 (3) Examines basic cultural values and the patterns of Chinese social life. Focuses on Chinese social organization and interpersonal dynamics, including the family system, gender identities, social exchanges and networks. All readings and discussions are in English. May not be used to satisfy general foreign language requirements. May also be offered as CHIN 4180.

ANTH (WS) 4230* Women in the Developing World 3 (3) Comparative anthropological study of women and their status in developing countries around the world. A survey of women's daily lives in a global context, emphasizing education, economics, and the environment. Case studies include microfinance, literacy, reproductive rights and practices, and the impact of religious fundamentalism on women. May also be offered as WS 4230. *Preq:* Sophomore standing.

ANTH (BIOL) 4510 Biological Variation in Human Populations 3 (3) Provides an in-depth discussion of the most influential topics in human skeletal biology. Course explores the history and ethical dilemmas of the field, and examines how biological anthropologists use skeletons to reconstruct patterns of diet, disease, demography and physical activity in human populations. May be offered as BIOL 4510. *Preq:* ANTH 2010.

ANTH 4530 Human Remains Recovery 3 (3) Provides an introduction to forensic anthropology field methods. Students locate, excavate, and recover simulated human remains, associated personal effects, and other materials from both surface scatters and simulated clandestine graves. Students also learn the basics of human identification using simulated skeletal remains. *Preq:* Consent of instructor.

ANTH (BIOL) 4660 Evolution of Human Behavior 3 (3) Familiarizes students with the evolutionary basis of human behavior. Examines topics such as altruism, cooperation, mating systems, parental investment, and social systems using diverse examples, from hunter-gatherer to technological societies. May also be offered as BIOL 4660. *Preq:* ANTH 3510 or BIOL 3350 or BIOL 4700 or BIOL 6700 or PSYC 2010.

ANTH (BIOL) 4740* Primatology 4 (3) Biology of nonhuman primates, including their evolution, taxonomy, physiology, life history, behavioral ecology and conservation. Three field trips are required, during which students conduct behavioral observations and later analyze their data and present it in report format. May also be offered as BIOL 4740. *Preq:* ANTH 3510; and either BIOL 1110 or both BIOL 1040 and BIOL 1060. *Coreq:* ANTH 4741.

ANTH (BIOL) 4741* Primatology Laboratory 0 (3) Non-credit laboratory to accompany ANTH 4740. May also be offered as BIOL 4741. *Coreq:* ANTH 4740.

ANTH 4950 Field Studies 1-6 (1-6) Group field project in settings selected by the instructor to provide students with a variety of exposures to various cultural contexts. Archaeological digs are included. Project progress and student interpretations of findings are monitored by periodic group meetings and shared experiences. May be repeated for a maximum of six credits. *Preq:* Consent of instructor.

ANTH 4960 Creative Inquiry 1-3 (1-3) Investigates topics in anthropology selected by faculty and students. Goals, research, and outcomes vary from semester to semester and project to project. May be repeated for a maximum of 12 credits. *Preq:* ANTH 2010 and consent of instructor.

ANTH 4980 Independent Study 1-3 (1-3) Individual readings or projects in anthropological areas not covered in other courses. May be repeated for a maximum of six credits with advisor's approval. *Preq:* ANTH 2010 and consent of instructor.

ANTH 4990 Special Topics 1-3 (1-6) Anthropological topics of special interest are explored. May be repeated for a maximum of six credits if different topics are covered.

ARABIC

Lecturer: S. Abousamra

ARAB 1000 Introduction to Arabic Conversation and Comprehension 3 (3) Introduction to the Arabic language and its different dialects and cultures. Also prepares students who wish to travel to Arabic speaking countries.

ARAB 1010 Elementary Arabic I 4 (3) Introductory course for beginners emphasizing acquisition of the Arabic alphabet and writing, basic grammar, vocabulary, speaking and listening skills, and developing strategies for the successful long-term acquisition of Arabic. *Coreq:* ARAB 1011.

ARAB 1011 Elementary Arabic I Laboratory 0 (1) Non-credit laboratory to accompany ARAB 1010. *Coreq:* ARAB 1010.

ARAB 1020 Elementary Arabic II 4 (3) Continuation of ARAB 1010 consisting of three hours a week of classroom instruction and one hour a week in the language laboratory. *Preq:* ARAB 1010. *Coreq:* ARAB 1021.

ARAB 1021 Elementary Arabic II Laboratory 0 (1) Non-credit laboratory to accompany ARAB 1020. *Coreq:* ARAB 1020.

ARAB 2010 Intermediate Arabic I 3 (3) Continuation of ARAB 1020, emphasizing grammar, vocabulary, writing, reading, and acquisition of intermediate language skills. *Preq:* ARAB 1020. *Coreq:* ARAB 2011.

ARAB 2011 Intermediate Arabic I Laboratory 0 (1) Non-credit laboratory to accompany ARAB 2010. *Coreq:* ARAB 2010.

ARAB 2020 Intermediate Arabic II 3 (3) Continuation of ARAB 2010, emphasizing grammar, vocabulary, writing, reading, and acquisition of advanced intermediate language skills. *Preq:* ARAB 2010. *Coreq:* ARAB 2021.

ARAB 2021 Intermediate Arabic II Laboratory 0 (1) Non-credit laboratory to accompany ARAB 2020. *Coreq:* ARAB 2020.

ARAB 3050 Intermediate Arabic Conversation and Composition 3 (3) Practice in modern standard Arabic with emphasis on vocabulary, pronunciation, intonation and comprehension. Includes written work to increase accuracy and assignments in the language laboratory. *Preq:* ARAB 2020.

ARCHITECTURE

Professors: D.J. Allison; J.F. Barker, *President Emeriti*; K.E. Green; R.J. Hogan, *Associate Chair*; A. Kahera, *Associate Dean*; K.L. Schwennsen, *Director*; *Associate Professors:* D.G. Battisto; V.Y. Blouin; D.N. Harding; D.A. Hecker; U. Heine, *Associate Chair*; R.T. Huff (Charleston); A. Joseph, *Endowed Chair*; R.T. Silance; *Assistant Professors:* D.G. Albright, C.R. Barrios Hernandez, U. Ersoy, D. Franco, S.R. Hambright-Belue, P.L. Laurence, D.M. Lee, A.E. Montilla; *Senior Lecturers:* R.A. Bruhns, A.H. Jacques, C.B. Mills; *Lecturers:* J. Choma, B. Edwards, J.B. Garland, C. Mendez, A.K. Jennings (Charleston), J.A. Lindsey (Charleston), D.A. Pastre (Charleston), J. Satoh, J.G. Thomas (Charleston), J. Wilkerson

ARCH 1010 Introduction to Architecture 3 (3) Introduction to the discipline and profession of architecture. Lectures and discussion cover a broad range of architectural issues throughout history. Emphasizes the relationship between architecture and other disciplines as well as across cultures. Includes the development of individual digital portfolio.

ARCH 1510 Architecture Communication 5 (2) Introduction to principles and elementary vocabulary of architectural design. Collaborative studio which offers instruction in the specific skills of formal design composition, visual communication, oral presentation, and computer literacy. *Preq:* ARCH 1010. *Coreq:* ARCH 1511.

ARCH 1511 Architecture Communication Laboratory 0 (6) Non-credit laboratory to accompany ARCH 1510. *Coreq:* ARCH 1510.

ARCH 1520 Collaborative Studio II 3 (1) Continuation of ARCH 1510. Introduction to an elemental vocabulary of architecture within basic spatial design problems, emphasizing visual communications skills, oral presentations of work, and analysis and discussion of design issues through critical readings of canonical texts and buildings. *Preq:* ARCH 1510. *Coreq:* ARCH 1521.

ARCH 1521 Collaborative Studio II Laboratory 0 (6) Non-credit laboratory to accompany ARCH 1520. *Coreq:* ARCH 1520.

ARCH 2040 History of Modern Architecture 3 (3) Survey of the modern period featuring special topics in the history of architecture. Emphasis is on typologies, historical antecedents and European precedents which give shape to buildings in the period of study. Key aspects of architectural theory and practice will be highlighted. *Preq:* AAH 1020.

ARCH 2510 Architecture Foundations I 6 (2) Architectural analysis and design problems with a focus on understanding the context of architecture. Specific investigation of buildings as part of the cityscape and the landscape. Instruction on visual communications skills, computer modeling, and oral presentation techniques support the design discussions. *Preq:* ARCH 1510. *Coreq:* ARCH 2511.

ARCH 2511 Architecture Foundations I Laboratory 0 (10) Non-credit laboratory to accompany ARCH 2510. *Coreq:* ARCH 2510.

ARCH 2520 Architecture Foundations II 6 (2) Continuation of ARCH 2510. Architectural design problems with a focus on structural and construction principles and their relationship to contextual situations. Instruction in oral communication skills and computer graphics support the design discussions. *Preq:* ARCH 2510. *Coreq:* ARCH 2521.

ARCH 2521 Architecture Foundations II Laboratory 0 (10) Non-credit laboratory to accompany ARCH 2520. *Coreq:* ARCH 2520.

ARCH 2700 Structures I 3 (3) The study of statically determinate structural elements and systems including load tracing through physical modeling and theoretical and analytical analysis, the interrelationship between stress and strain, stability and the implication of tension, compression, shear torsion and bending. *Preq:* PHYS 2070 and PHYS 2090.

ARCH 2710 Structures II 3 (3) The study of force distributions and behavior in building structures constructed of reinforced concrete, steel and wood. Exploration of typical building components including beams, slabs, columns and foundations and how they are used in high-rise and long span structural design. *Preq:* ARCH 2700 or CSM 2010.

ARCH 3510 Studio Clemson 6 (1) Addresses architectural problems with varied scales, programs, and locations. Emphasizes the relationship between architecture and context. Projects include analysis, conceptual development, and architectonic resolutions. Continued development of graphic and oral communication skills. Design problems vary every semester according to current issues. May be repeated for a maximum of 18 credits. *Preq:* ARCH 2520. *Coreq:* ARCH 3511.

ARCH 3511 Studio Clemson Laboratory 0 (11) Non-credit laboratory to accompany ARCH 3510. *Coreq:* ARCH 3510.

ARCH 3520 Studio Charleston 6 (1) Addresses architectural problems with varied scales and programs in the context of Charleston, South Carolina. Emphasizes the relationship between architecture and context. Projects include analysis, conceptual development, and architectonic resolutions. Continued development of graphic and oral communication skills. Design problems vary every semester according to current issues. May be repeated for a maximum of 12 credits. *Preq:* ARCH 2520. *Coreq:* ARCH 3521.

ARCH 3521 Studio Charleston Laboratory 0 (11) Non-credit laboratory to accompany ARCH 3520. *Coreq:* ARCH 3520.

ARCH 3530 Studio Genoa 6 (1) Addresses architectural problems with varied scales and programs in the context of Genoa, Italy, and historic Europe. Emphasizes the relationship between architecture and context. Projects include analysis, conceptual development, and architectonic resolutions. Design problems vary every semester according to current issues. Continued development of graphic and oral communication skills. May be repeated for a maximum of 12 credits. *Preq:* ARCH 2520. *Coreq:* ARCH 3531.

ARCH 3531 Studio Genoa Laboratory 0 (11) Non-credit laboratory to accompany ARCH 3530. *Coreq:* ARCH 3530.

- ARCH 3540 Studio Barcelona 6 (1)** Addresses architectural problems with varied scales and programs in the context of Barcelona, Spain. Emphasizes the relationship between architecture and context. Projects include analysis, conceptual development, and architectonic resolutions. Continued development of graphic and oral communication skills. Design problems vary every semester according to current issues. May be repeated for a maximum of 12 credits. *Preq:* ARCH 2520. *Coreq:* ARCH 3541.
- ARCH 3541 Studio Barcelona Laboratory 0 (11)** Non-credit laboratory to accompany ARCH 3540. *Coreq:* ARCH 3540.
- ARCH 3550 Studio South 6 (1)** Addresses architectural problems with varied scales and programs in the context of the South. Emphasizes the relationship between architecture, community, and context. Projects include analysis, conceptual development, and architectonic resolutions. Continued development of graphic and oral communication skills. Design problems vary every semester according to current issues. May be repeated for a maximum of twelve credits. *Preq:* ARCH 2520. *Coreq:* ARCH 3551.
- ARCH 3551 Studio South Laboratory 0 (11)** Non-credit laboratory to accompany ARCH 3550. *Coreq:* ARCH 3550.
- ARCH 4010 Architectural Portfolio 3 (3)** Continues portfolio development for Architecture students, including professional portfolio, academic portfolio, and digital portfolio. *Preq:* ARCH 2520.
- ARCH 4030 The Modern Architectural Movement 3 (3)** Seminar in the analysis and criticism of architectural and town building works. Course sequence includes historic and contemporary examples, literary searches, field trips, essays, and oral reports. *Preq:* Senior standing.
- ARCH 4040 Current Directions in Architecture 3 (3)** Critical analysis of the development and current directions of modern movements in architecture. *Preq:* Senior standing.
- ARCH 4050* American Architectural Styles 1650–1950 3 (3)** Survey of American architectural styles and of the architects responsible for them, from the Colonial period to our recent past. Considerable emphasis is placed on identifying those architectural elements which serve as clues in determining a building's architectural style.
- ARCH 4120* Architectural History Research 3 (3)** Directed investigations related to the art and architectural history of Europe. May be repeated for a maximum of six credits. *Preq:* Junior standing.
- ARCH 4140* Design Seminar 3 (3)** Exploration of topical issues in architecture, art, construction, and planning. May be repeated for a maximum of six credits. *Preq:* Junior standing.
- ARCH 4160* Field Studies in Architecture and Related Arts 3 (3)** Documentation and analysis of architectural structures observed during European travels in graphic and written form. May be repeated for a maximum of six credits. *Preq:* Junior standing.
- ARCH 4210 Architectural Seminar 3 (3)** Lectures and seminars dealing with pertinent topics related to environmental and technological considerations in architecture and the building industry. *Preq:* Senior standing.
- ARCH 4240* Product Design 3 (9)** Furniture and product system design with emphasis on ergonomics and the relationship of form and materials. *Preq:* Senior standing.
- ARCH 4250* Energy in Architecture 3 (3)** Climate design methodology and its influence on building energy patterns and architectural form. *Preq:* Senior standing and consent of instructor.
- ARCH 4260* Architectural Color Graphics 3 (3)** Architectural color graphics by computer. Theories of color classification and interaction; application of color theories to art and architecture. *Preq:* Consent of instructor.
- ARCH 4270* Advanced Color Graphics 3 (3)** Theories of color classification and interaction; three-dimensional color modeling by computer; advanced application of color theories to art and architecture. *Preq:* ARCH 4260.
- ARCH 4280* Computer-Aided Design 3 (2)** Introduction to the concepts, skills, and applications of computer-aided design as they relate to the practice of architecture. *Preq:* Senior standing. *Coreq:* ARCH 4281.
- ARCH 4281* Computer-Aided Design Laboratory 0 (3)** Non-credit laboratory to accompany ARCH 4280. *Coreq:* ARCH 4280.
- ARCH 4290* Architectural Graphics 3 (3)** Provides students with an understanding of the concepts, skills, techniques, and strategies of visual presentation/graphics as they relate to the design professions—architects/landscape architects. *Preq:* Junior standing.
- ARCH 4300* Theories and Philosophies of Technology and Architecture 3 (3)** Theoretical and practical examination of technology and architecture from pre-modern and modern viewpoints to study its nonneutral role in shaping and reflecting knowledge, beliefs, and actions within a cultural context.
- ARCH 4400* New York Field Study 3 (3)** Study of architecture, art, planning, and urban design of New York. Two weeks of residence are required with scheduled field trips to relevant sites in all five boroughs, with counseling to determine research interests. Guidance is provided to resources in the city. A final report is required. Offered in the summer only.
- ARCH 4510 Architecture Studio III 6 (11)** Continuation of ARCH 3520. Advanced architectural issues of program and theory, synthesis of ideas, and self-criticism. *Preq:* ARCH 3520.
- ARCH 4520 Synthesis Studio 6 (1)** Integrates acquired skills, abilities, and interests from previous architecture studios. Projects emphasize the accumulation of architectural experiences and knowledge. *Preq:* Senior standing. *Coreq:* ARCH 4521.
- ARCH 4521 Synthesis Studio Laboratory 0 (11)** Non-credit laboratory to accompany ARCH 4520. *Coreq:* ARCH 4520.
- ARCH 4710 Architectural History of Place 3 (3)** Survey of urban design and architectural history using examples viewed in a particular locale. Emphasizes an overview survey of design movements identifying specific design elements and understanding how they are used in shaping place. Course is offered only during the summer at study abroad locations. *Preq:* ARCH 1010.
- ARCH 4720 Architectural Field Studies 3 (1)** Students develop diagramming and writing skills and use them to document and analyze existing works of urban design and architecture observed during field trips. Course is only offered during the summer at study abroad locations. *Preq:* ARCH 1010. *Coreq:* ARCH 4721.
- ARCH 4721 Architectural Field Studies Laboratory 0 (6)** Non-credit laboratory to accompany ARCH 4720. *Coreq:* ARCH 4720.
- ARCH 4770* Introduction of Craft 1-3 (1-3)** Architectural craft lab offered under different material specializations, all of which introduce students to design as informed by craft through a hands-on lab. Basic craft operations and material properties are introduced for the subject material (wood, steel, etc.) May be repeated for a maximum of six credits.
- ARCH 4850* History and Theory of Architecture + Health 3 (3)** Introduces relationships between health and architectural settings for health. Examines connections between cultural context, medical thought, health-care delivery, and health facility design within different time periods. Introduces contemporary theories on the relationships between human beings, their health and well-being, and the design of the physical environment. *Preq:* Consent of instructor.
- ARCH 4880* Architectural Programming and Predesign 3 (3)** Introduces the theory, mechanics, and practice of architectural programming and post-occupancy evaluation. Presents programming as a means to create architectural settings sensitive to the needs of their inhabitants. Emphasizes collaborative methodologies that involve identifying relevant goals, facts, issues, needs, and concepts. Students develop an architectural program. *Preq:* Consent of instructor.
- ARCH 4890 Internship 1-6 (1-6)** Practicum in professional practice. Paid work/study in a variety of related disciplines provides students with hands-on experience in design and fabrication fields relevant to the environmental design professions. Consists of two parts: a professional component, managed by an approved sponsor, and an academic component, taught by the instructor. May be repeated for a maximum of 18 credits. *Preq:* Consent of instructor and acceptance by sponsor.
- ARCH 4900 Directed Studies 1-5 (1-5)** Comprehensive studies and research of special topics not covered in other courses. Emphasis is on field studies, research activities, and current developments in architecture. May be repeated for a maximum of ten credits. Includes Honors sections. *Preq:* Consent of department chair.
- ARCH 4990 Selected Topics in Architecture 1-3 (1-3)** Study of selected topics in architecture. May be repeated for a maximum of nine credits, but only if different topics are covered. Includes Honors sections. *Preq:* Junior standing.

ART

Professors: A.V. Feeser, D.M. Detrich, G.W. Shelnutt, *Chair;* *Associate Professors:* D. Donar, C.N. Hung, T. McDonald, A. Wrangle; *Assistant Professors:* B.A. Lauritis, K. Thum, V.A. Zimany; *Senior Lecturers:* J.R. Manson, D.C. Woodward-Detrich; *Lecturer:* L. Dorsey

- ART 1030 Visual Arts Studio 3 (6)** Studio projects in basic visual elements and principles. The development of creative design process, visual organization, and design skills are introduced as a foundation for further study in visual arts.
- ART 1050 Foundation Drawing I 3 (3)** Introduction to drawing. Presents exploration of observational drawing practices with an emphasis on structural investigations of form and application of spatial systems. Basic materials and approaches associated with drawing are studied and applied. *Preq:* Visual Arts major.
- ART 1060 Foundation Drawing II 3 (3)** Further exploration of introductory drawing. Emphasizes use of tone and color. Students work primarily with representational categories, developing comprehension of complex forms and spaces in relation to the 2-D planes. Includes use of rigorous observational drawing practices in conjunction with thematic efforts. *Preq:* ART 1050 or ART 1510.
- ART 1510 Foundations in Visual Art I 3 (6)** Intensive introduction to the fundamentals of visual art. Studio projects, lectures, and discussions introduce topics and projects relative to foundation-level art students. Explores historical and contemporary applications of the elements and principles of design. *Preq:* Visual Arts major.
- ART 1520 Foundations in Visual Art II 3 (6)** Intensive introduction to the fundamentals of visual art. Studio projects, lectures, and discussions introduce topics and projects relative to foundation-level art students. Explores historical and contemporary applications of the elements and principles of design. *Preq:* Visual Arts major.
- ART 1530 Orientation to Visual Arts I 1 (1)** Introduction to the visual arts profession focusing on issues related to various career opportunities, creativity, problem-solving methodologies, and current thinking in contemporary art. *Preq:* Visual Arts major.
- ART 2050 Beginning Life Drawing 3 (6)** Primary emphasis is on drawing from the live model. Students' drawing skills and fundamental understanding of the structure and form of the human figure are reviewed through studio practice, augmented by lectures, discussions, demonstrations, and critiques. Addresses historical and contemporary use of the human figure in visual arts. *Preq:* ART 1060 or ART 1510 or ART 1520.
- ART 2070 Beginning Painting 3 (6)** Introduction to basic materials, methods, and techniques of painting. Primary medium used is acrylic, and other painting media may also be introduced. Emphasizes basic skills in painting plus individual creative development. *Preq:* ART 1510 and ART 1530 and ART 2050 (Visual Arts majors); ART 1030 (non-Art Majors); ARCH 1520 (Architecture majors); LARC 1520 (Landscape Architecture majors).
- ART 2090 Beginning Sculpture 3 (6)** Studio course investigating the meaning of sculpture through traditional and nontraditional approaches. Establishes a working knowledge of material and process in several media. Personal expression is encouraged and enhanced by employment of problem-solving techniques. Static, temporal, installation, and site specific sculpture is explored. *Preq:* ART 1510 and ART 1520 and ART 1530 and ART 1540 and ART 2050 (Visual Arts majors); ART 1030 (non-Art majors); ARCH 1520 (Architecture majors); LARC 1520 (Landscape Architecture majors).
- ART 2100 Art Appreciation 3 (3)** One-semester lecture survey that introduces the nonmajor to an overview of art and architecture from different time periods and cultures. Students are encouraged to appreciate the contribution to art made by the great masters and to discern different styles, art techniques, and creative traditions. Includes Honors sections.
- ART 2110 Beginning Printmaking 3 (6)** Studio course introducing basic techniques of relief printing, intaglio, lithography, silkscreen, and papermaking. Each semester concentrates on two or three of these techniques. Coursework integrates print-making processes and creativity. *Preq:* ART 1510 and ART 1520 and ART 1530 and ART 1540 and ART 2050 (Visual Arts majors); ART 1030 (non-Art majors); ARCH 1520 (Architecture majors); LARC 1520 (Landscape Architecture majors).
- ART 2130 Beginning Photography 3 (6)** Introduction to the use of photography as an art medium. Lectures and studio work cover the utilization of the camera, processing, and printing in black and white, with emphasis on perception and creative expression. *Preq:* ART 1510 and ART 1520 and ART 1530 and ART 1540 and ART 2050 (Visual Arts majors); ART 1030 (non-Art majors); ARCH 1520 (Architecture majors); LARC 1520 (Landscape Architecture majors).
- ART 2150 Beginning Graphic Design 3 (6)** Introduction to fundamental techniques, concepts, and principles of visual communication. Through a series of projects and studio work, students explore techniques of communication through the use of type design, typography, photography, illustration, symbolism, and product design. Individual creative development is stressed. *Preq:* ART 1510 and ART 1520 and ART 1530 and ART 1540 and ART 2050 (Visual Arts majors); ART 1030 (non-Art majors); ARCH 1520 (Architecture majors); LARC 1520 (Landscape Architecture majors).
- ART 2170 Beginning Ceramics 3 (6)** Basic studio course introducing ceramic arts through its various processes and techniques. Hand building methods as well as throwing on the potter's wheel are developed. Weekly projects emphasize imagination, self-expression, and skill development. Ceramic history is introduced through slide lectures. *Preq:* ART 1510 and ART 1520 and ART 1530 and ART 1540 and ART 2050 (Visual Arts majors); ART 1030 (non-Art majors); ARCH 1520 (Architecture majors); LARC 1520 (Landscape Architecture majors).
- ART 2210 Beginning New Media 3 (6)** Explores new media art practices and ideas. Digital tools and processes are explored relative to drawing, painting, printing, bookmaking, and photography. Introduces new media as a context of new collective, interactive, and social modes of art production. *Preq:* ART 1060 and ART 1510 and ART 1520.
- ART 2230 Woodworking Studio 3 (6)** Introduces woodworking explorations in sculpture and furniture design emphasizing technical understanding and creative application of woodworking processes and methodologies. Students experiment with wood as a vehicle for personal expression and thematic development and conduct research on the historical impact of woodworking in the visual arts. *Preq:* ART 1510; and one of ART 1520 or ARCH 1520 or LARC 1520.
- ART 3050 Intermediate Drawing 3 (6)** Presents drawing problems and processes directed toward the production of thematically driven projects. Exploration of diverse drawing media. Emphasizes further development of drawing skills, relationships of materials/techniques to subject matter, and the study of contemporary issues in drawing. *Preq:* ART 2050.
- ART 3070 Painting 3 (6)** Continuation of ART 2070 with increased emphasis on personal expression and growth in technical competence. Some study of painting history is included in studio activity. *Preq:* ART 2070.
- ART 3090 Sculpture 3 (6)** Continuation of ART 2090 with increased emphasis on personal expression and content of work. Further exploration of materials and processes, including an introduction to foundry casting and advanced welding techniques. Individual investigation into current and historical aspects of sculpture is required. *Preq:* ART 2090.
- ART 3110 Printmaking 3 (6)** Continuation of processes in beginning printmaking emphasizing expanding the range and depth of technique. The relationship of technique and process to creative idea development is emphasized. *Preq:* ART 2110.
- ART 3120 Printmaking Research I 1-3 (1-3)** Continuation of ART 3110. Technical and conceptual research in printmaking to develop self-expression. Special projects are constructed in consultation with instructor. May be repeated for a maximum of five credits. *Preq:* ART 3110.
- ART 3130 Photography 3 (6)** Continuation of ART 2130. Advanced techniques and more diverse types of film and paper are used in making images of personal and expressive nature. The design and construction of a view camera, printing in color, and multiple imagery may also be included. *Preq:* ART 2130.
- ART 3150 Graphic Design 3 (6)** Continuation of concepts and techniques introduced in ART 2150 with emphasis on more applied projects. Individual creative solutions are emphasized. *Preq:* ART 2150.
- ART 3170 Ceramic Arts 3 (6)** Continuation of skill development leading to more challenging projects and independent efforts. Further exposure to ceramic history and ceramic technology is presented. *Preq:* ART 2170.

- ART 3180 Ceramics Research I 1-3 (1-3)** Continuation of ART 3170. Technical and conceptual research in ceramics for the purpose of self-expression. Projects are constructed in consultation with instructor. May be repeated for a maximum of five credits. *Prq:* ART 3170.
- ART 3210 New Media Art II 3 (6)** Intermediate-level course that introduces students to time-based art practices such as video art, installation, and performance art forms. Through regularly scheduled studio projects, readings, and screenings, students develop video, installation, and motion graphic techniques, and receive a historical overview of time-based art practices. *Prq:* ART 2210.
- ART 3230 Digital Sculpture 3 (6)** Studio course covering digital processes applied to making sculpture. Explores digital media as a resource for creative development, creating digital renderings of sculptures, and the fabrication of models and sculptures using CNC technology. *Prq:* ART 2090 and ART 3210.
- ART 3550 Atelier InSite Creative Inquiry I 3 (6)** An in-depth examination and research of Site Specific Public Art as it currently exists. Course provides critically considered and appropriate artwork for new building projects on the Clemson University campus. Open to students from a wide variety of programs who are interested in this interdisciplinary collaborative endeavor.
- ART 3570 Community Supported Art—Creative Inquiry 1-3 (2-6)** Examination and research of arts non-profit fundraising models in various iterations. This course provides a sampling of professional marketing, social networking and other professional development practices for artists and arts organizations through real-world problem solving and application on the Clemson University campus or in the surrounding community. May be repeated for a maximum of nine credits.
- ART 3750 Writing for the Arts in Charleston 3-6 (3-6)** Using Charleston's international Spoleto Festival USA as a laboratory, students engage in interdisciplinary, critical readings and observations of multiple elements of performing and visual arts programs, and write extensively about their place in a global, contemporary society. Students develop professional and technological literacies using print and digital media. Offered summer only. May be repeated for a maximum of six credits. *Prq:* ENGL 1030.
- ART 4050* Advanced Drawing 3 (6)** Advanced level studies of drawing which explore the synthesis of refined drawing skills and philosophies of art. Students' understanding of drawing as a form of art is developed through studio practice augmented by critiques, demonstrations, lectures, field trips, and independent research. *Prq:* ART 3050.
- ART 4070* Advanced Painting 3 (6)** Advanced studio course in painting. Students select painting media and develop a strong direction based on prior painting experience. Includes study of contemporary painters and directions. *Prq:* ART 3070.
- ART 4090* Advanced Sculpture 3 (6)** Intensive independent studio concentration to further develop personal direction and content. Emphasizes continued investigation of sculptural context, materials and processes, and relative historical research. *Prq:* ART 3090.
- ART 4110* Advanced Printmaking 3 (6)** Culmination of process, techniques, and individual development. Students are expected to have mastered process and technique for the benefit of the image produced. Creativity and self-expression are highly emphasized as students select a process for concentrated study. *Prq:* ART 3110.
- ART 4130* Advanced Photography 3 (6)** Continuation of ART 3130. Advanced problems in photography. *Prq:* ART 3130.
- ART 4150 Advanced Graphic Design 3 (6)** Continuation of ART 3150. Personal expression through communication techniques is further explored. Individual projects are emphasized. *Prq:* ART 3150.
- ART 4160 Advanced Media Art: Interactive Objects and Environments 3 (6)** Students apply advanced media art production skills to create objects and environments that respond to user input or interaction. Tools used may include, but are not limited to, microcontrollers, sensors, RFID systems and electronic circuits, as well as traditional input devices. *Prq:* ART 3210.
- ART 4170* Advanced Ceramic Arts 3 (6)** Students are directed toward further development of ideas and skills. Glaze calculation and firing processes are incorporated to allow for a dynamic integration of form and ideas. *Prq:* ART 3170.
- ART 4200* Selected Topics in Art 1-3 (1-3)** Intense course in studio art. May be repeated for a maximum of six credits, but only if different topics are covered. *Prq:* Senior standing.
- ART 4210 Two-Dimensional Digital Animation 3 (6)** Exposes students to the principles of animation with traditional techniques, while incorporating the latest 2-D digital tools. Students also develop interactive animations and showcase their work via the Internet. *Prq:* ART 3210.
- ART 4550 Atelier InSite Creative Inquiry II 3 (6)** An in-depth examination and research of Site Specific Public Art as it currently exists. Course provides critically considered and appropriate artwork for new building projects on the Clemson University campus. Continuation of ART 3550. Open to students from a wide variety of programs who are interested in this interdisciplinary collaborative endeavor. *Prq:* ART 3550.
- ART 4710 Bachelor of Fine Arts Senior Studio I 3 (6)** Individual studio project directed by an instructor and determined by the student in consultation with the instructor. Focuses on a particular studio area, concept, or theme. May be repeated for a maximum of six credits. *Prq:* Senior standing and completion of 3000/400 sequence in the chosen studio area, minimum grade-point average of 3.0 in focus studio area, participation in senior studio interview. *Coreq:* ART 4730.
- ART 4720 Bachelor of Fine Arts Senior Studio II 4 (12)** Individual studio project directed by an instructor and determined by the student in consultation with the instructor. Usually focuses upon a particular studio area, concept, or theme. *Prq:* ART 4710 with a B or better.
- ART 4730 Senior Seminar in Professional Career Preparation 3 (3)** Seminar and practical guide to prepare students for entry into the professional art world. Focuses on issues concerning visual artists in the early years of their professional activities. Presents career options and practical information for the graduating senior, including portfolio development. *Coreq:* ART 4710.
- ART 4740 Travel Seminar 1 (1)** Students travel with faculty to museums, galleries and festivals that directly affect studio practice, art history knowledge and engagement in historical and contemporary art practice. Students plan trips, conduct research, keep a journal and make presentations on works and sites visited and matters pertaining to professional practice. To be taken Pass/Fail only. May be repeated for a maximum of three credits. *Prq:* Junior standing.
- ART 4750 Senior Exhibition Internship 1 (3)** Students complete various projects related to their BFA Senior Exhibition during this weekly internship through Clemson University's Lee Gallery. The internship compliments the BFA studio curriculum by providing students access to professional practices in exhibition design and execution. *Prq:* ART 4710.
- ART 4890 Art and Art History Internship 1-3 (1-3)** Internship with an approved sponsoring art institution in support of professional development and best art practices. May be repeated for a maximum of six credits. *Prq:* Junior standing in Visual Arts and consent of instructor and acceptance by sponsor.
- ART 4900* Directed Studies 1-5 (1-5)** Study of areas in the visual arts not included in other courses or additional advanced work. Must be arranged with a specific instructor prior to registration. May be repeated for a maximum of 18 credits. Includes Honors sections. *Prq:* Consent of instructor.

AEROSPACE STUDIES

Professor: C.R. Mann, *Chair*; *Assistant Professors:* S.P. Jordan, S.D. Wiggins

- AS 1090 Air Force Today I 2 (1)** Deals with Air Force in the contemporary world through a study of the total force structure: strategic offensive and defensive, general purpose, and aerospace support. Leadership laboratory activities include drill fundamentals, customs, and courtesies of the service. *Coreq:* AS 1091.
- AS 1091 Air Force Today I Laboratory 0 (2)** Non-credit laboratory to accompany AS 1090. *Coreq:* AS 1090.
- AS 1100 Air Force Today II 2 (1)** Continuation of AS 1090. Leadership laboratory includes drill, ceremonies, and an introduction to Air Force career opportunities. *Coreq:* AS 1101.
- AS 1101 Air Force Today II Laboratory 0 (2)** Non-credit laboratory to accompany AS 1100. *Coreq:* AS 1100.
- AS 2090 Development of Air Power I 2 (1)** Study of the development of air power from balloons and dirigibles through the peaceful employment of U.S. air power in relief missions and civic action programs in the late 1960's and also the air war in Southeast Asia. Leadership laboratory provides experience in guiding, directing, and controlling an Air Force unit. *Coreq:* AS 2091.

- AS 2091 Development of Air Power I Laboratory 0 (2)** Non-credit laboratory to accompany AS 2090. *Coreq:* AS 2090.
- AS 2100 Development of Air Power II 2 (1)** Continuation of AS 2090. *Coreq:* AS 2101.
- AS 2101 Development of Air Power II Laboratory 0 (2)** Non-credit laboratory to accompany AS 2100. *Coreq:* AS 2100.
- AS 3090 Air Force Leadership and Management I 4 (3)** Emphasizes the individual as a manager. Individual motivational and behavioral processes, leadership, communication, and group dynamics are covered to provide a foundation for the development of the Air Force officer's professional skills. Students prepare individual and group presentations, write reports, participate in group discussions, seminars, and conferences. *Coreq:* AS 3091.
- AS 3091 Air Force Leadership and Management I Laboratory 0 (2)** Non-credit laboratory to accompany AS 3090. *Coreq:* AS 3090.
- AS 3100 Air Force Leadership and Management II 4 (3)** Continuation of AS 3090. Uses the basic managerial processes involving decision making, utilization of analytical aids in planning, organizing, and controlling environment. Actual case studies are used to enhance learning and communication processes. *Coreq:* AS 3101.
- AS 3101 Air Force Leadership and Management II Laboratory 0 (2)** Non-credit laboratory to accompany AS 3100. *Coreq:* AS 3100.
- AS 4090 National Security Policy I 4 (3)** Analysis of the role and function of the military officer in a democratic society and the relationships involved in civil-military interactions. Students prepare individual and group presentations, write reports, and participate in group discussions. *Coreq:* AS 4091.
- AS 4091 National Security Policy I Laboratory 0 (2)** Non-credit laboratory to accompany AS 4090. *Coreq:* AS 4090.
- AS 4100 National Security Policy II 4 (3)** Continuation of AS 4090. Examines the environmental context in which U.S. defense policy is formulated and implemented. Emphasizes initial commissioned service and military justice. Students prepare individual and group presentations for the class, write reports, and participate in group discussions, seminars, and conferences. *Coreq:* AS 4101.
- AS 4101 National Security Policy II Laboratory 0 (2)** Non-credit laboratory to accompany AS 4100. *Coreq:* AS 4100.
- AMERICAN SIGN LANGUAGE**
Assistant Professor: S. Fitzmaurice; *Lecturers:* A. Brant, P. May, K. Misener Dunn
- ASL 1010 American Sign Language I 4 (3)** Introduction to the basics of American Sign Language, its history, and culture. Visual-gestural communication techniques are used. *Coreq:* ASL 1011.
- ASL 1011 American Sign Language I Laboratory 0 (1)** Non-credit laboratory to accompany ASL 1010. *Coreq:* ASL 1010.
- ASL 1020 American Sign Language I 4 (3)** Continuation of ASL 1010 and culture to develop further communicative competencies. Proficiency oriented with the use of visual-gestural communication skills. *Preq:* ASL 1010. *Coreq:* ASL 1021.
- ASL 1021 American Sign Language I Laboratory 0 (1)** Non-credit laboratory to accompany ASL 1020. *Coreq:* ASL 1020.
- ASL 2010 American Sign Language II 3 (3)** Continuation of ASL 1020. Covers additional vocabulary, sentences, and grammar structures. Main focus is on conversational and receptive skills as well as a better understanding of Deaf culture. *Preq:* ASL 1020.
- ASL 2020 American Sign Language II 3 (3)** Continuation of ASL 2010, concentrating on intermediate conversational and discourse skills using American Sign Language, more complex American Sign Language grammar, reading comprehension, and composition of short stories, narratives, and dialogues with an emphasis on topics related to the Deaf community. Class is conducted totally in American Sign Language using visual-gestural communicative techniques. *Preq:* ASL 2010.
- ASL 2970 Creative Inquiry—American Sign Language I 4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. *Preq:* Consent of faculty member because arrangements with faculty member must be established prior to registration.
- ASL 3000 Fingerspelling and Numbers in American Sign Language I (1)** Advanced study of the manual alphabet (fingerspelling) and the numerical system in American Sign Language, with extensive practice in both expressive and receptive skills. *Preq:* ASL 2010.
- ASL 3010 Advanced American Sign Language I 3 (3)** Focuses on American Sign Language fluency, vocabulary development, grammatical structures of American Sign Language, use of classifiers, conversational skills, translating written texts into American Sign Language, and vice versa. Emphasis is on making formal presentations in American Sign Language. *Preq:* ASL 2020.
- ASL 3020 Advanced American Sign Language II 3 (3)** Continuation of ASL 3010. Focuses on American Sign Language fluency, vocabulary development, grammatical structures of American Sign Language, use of classifiers, conversational skills, translating written texts into American Sign Language, and vice versa. Emphasis is on making formal presentations in American Sign Language. *Preq:* ASL 3010.
- ASL 3040 Internship in American Sign Language 3 (4)** Minimum 60 contact hours in an environment exclusively using American Sign Language. Frequent opportunities to converse with native signers in classroom settings, dormitory settings, meals, excursions, sporting events, cultural events, and meetings. *Preq:* ASL 2020.
- ASL 3050 Deaf Studies in the United States 3 (3)** In-depth look into language, culture, and daily lives of approximately one million people who use American Sign Language as their primary language. Traces the roots of American Sign Language from pre-revolutionary times to current science and knowledge and how it applies to professional fields. *Preq:* ASL 2020.
- ASL 3150 Survey of Interpreting in Public Schools 3 (3)** Overview of the ASL/English interpreting profession in public schools. Includes discussions about the role, function, and aptitudes of educational interpreters, the bilingual and bicultural context, history of interpreting, principles of professional practice, laws that affect educational interpreting, and analysis of the impact of classroom variables on accessibility and interpretability. *Preq:* ASL 2010.
- ASL 3200 American Sign Language—English Interpreting in Elementary Schools I 3 (3)** ASL/English interpreting in the elementary classroom. Includes analysis of the discursive features of elementary classrooms; translation of materials encountered in elementary classrooms; rendering of interpretations of elementary classroom discourse, both consecutively and simultaneously; and assessment of the effectiveness of interpreted products. *Preq:* ASL 3150.
- ASL 3250 American Sign Language—English Interpreting in Secondary Schools I 3 (3)** ASL/English interpreting in the high school classroom. Includes analysis of the discursive features of several high school courses; translation of materials encountered in high school classrooms; rendering interpretations, both consecutively and simultaneously; and assessment of the effectiveness of interpreted products. *Preq:* ASL 3150.
- ASL 3450 American Sign Language for Health Care Practitioners I 3 (3)** Intermediate instruction of specific health care and medical terminology in American Sign Language. Topics relate to specific body systems, medical terminology, and cultural aspects that have a direct bearing on medical treatment and understanding the deaf patient. *Preq:* ASL 3020.
- ASL 3490 Advanced Applications in American Sign Language 3 (3)** Study of select signs in American Sign Language emphasizing culturally appropriate signs in education, psychology/mental health, legal/legislation, health/medicine, religion, drugs/alcohol, and technology. May be repeated for a maximum of six credits. *Preq:* ASL 2020.
- ASL 3970 Creative Inquiry—American Sign Language I 4 (1-4)** Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.
- ASL 4010 Discourse in American Sign Language I 3 (3)** Designed for advanced-level students in American Sign Language. Primary goal is to further develop students' understanding and knowledge of American Sign Language by incorporating in-depth analysis of American Sign Language's historical development, linguistic structures, syntax, grammar, and pragmatics. *Preq:* ASL 3020.
- ASL 4020 Discourse in American Sign Language II 3 (3)** Continuation of American Sign Language 4010. Primary goal is to further develop students' understanding and knowledge of American Sign Language by incorporating analysis of time concepts, variations due to region and ethnicity, pluralization, classifiers, locatives, temporal aspects, and pronoun usage in American Sign Language. *Preq:* ASL 4010.

ASL 4200 American Sign Language/English Interpreting in Elementary Schools II 3 (3) Continuation of ASL 3200. Further analyses of elementary school curricular discourse; rendering interpretations of elementary school classroom discourse simultaneously; preparation and interpretation or presentations from second language into first language; and assessment of the effectiveness or interpreted products. *Prq:* ASL 3200.

ASL 4250 American Sign Language/English Interpreting in Secondary Schools II 3 (3) Continuation of ASL 3250. Further analyses of high school curricular discourse; rendering interpretations of high school classroom discourse simultaneously; preparing and interpreting presentations from second language to first language; and assessment of the effectiveness of interpreted products. *Prq:* ASL 3250.

ASL 4450 American Sign Language for Health Care Practitioners II 3 (3) Continuation of ASL 3450. Expands health care and medical terminology in American Sign Language. Topics relate to specific body systems, ASL medical terminology, insurance, and medications. *Prq:* ASL 3450.

ASL 4600 Deaf Literature and Folklore 3 (3) Designed for advanced-level students in American Sign Language. Primary goal is to further develop students' knowledge and understanding of Deaf literature, folklore, and the community at large. Includes introductions to deaf authors, literary works, plays, poetry, painting, and sculpture. *Prq:* ASL 3020.

ASL 4970 Creative Inquiry—American Sign Language 1-4 (1-4) Continuation of research initiated in ASL 3970. Students complete their projects and disseminate their research results. *Prq:* ASL 3970.

ASL 4980 Independent Study 1-3 (1-3) Supervised research and study on topics related to the origins and growth of American Sign Language and the Deaf Community in the United States (1800–present). May be repeated for a maximum of six credits. *Prq:* ASL 2020.

ASTRONOMY

Professors: D.H. Hartmann, M.D. Leising, B.S. Meyer; *Associate Professors:* P.J. Flower, J.R. King; *Assistant Professor:* S. Brittain

ASTR 1010 Solar System Astronomy 3 (3) Descriptive survey of the universe, with emphasis on basic physical concepts and the objects in our solar system. Related topics of current interest are included. For nonscience majors.

ASTR 1020 Stellar Astronomy 3 (3) Descriptive survey of the universe, with emphasis on basic physical concepts and galactic and extragalactic objects. Related topics of current interest are included. For nonscience majors. May not be taken by students who have completed ASTR 3020.

ASTR 1030 Solar System Astronomy Laboratory 1 (2) Optional laboratory to accompany ASTR 1010. Demonstrations, laboratory exercises, and planetarium visits supplement the lecture course. *Prq or concurrent enrollment:* ASTR 1010.

ASTR 1040 Stellar Astronomy Laboratory 1 (2) Optional laboratory to accompany ASTR 1020. Demonstrations, laboratory exercises, and planetarium visits supplement the lecture course. *Prq or concurrent enrollment:* ASTR 1020.

ASTR 1050 Physics of the Universe 3 (3) Basic physics principles of Newtonian mechanics, special and general relativity, quantum mechanics, atomic structure, thermal physics, optics, and radiation physics are qualitatively and quantitatively presented. These principles are then applied to demonstrate their usefulness in understanding fundamental astrophysical objects and processes in the cosmos. *Prq:* MATH 1050.

ASTR (GEOL) 2200 Planetary Science 3 (3) Survey of the formation and evolution of planetary bodies. Emphasizes the origin of planetary material and comparative study of the primary processes operative on planetary surfaces. Describes major features of the planets and moons in our solar system, as revealed by recent space missions. May also be offered as GEOL 2200.

ASTR 3020 Stellar Astrophysics 3 (3) Study of the basic physical concepts necessary for understanding the sun, other stars, and their evolution. Topics include star formation, stellar structure and evolution, binary stars, and observational techniques. *Prq:* PHYS 2210.

ASTR 3030 Galactic Astrophysics 3 (3) Study of basic physical concepts necessary for understanding the structure of the galaxy, the motions of the stars within it, the nature of the interstellar matter, other galaxies, the large-scale structure of the universe, and the origin of the solar system. *Prq:* PHYS 2210.

ASTR 4750 Selected Topics in Astrophysics 1-3 (1-3) Comprehensive study of an area of astrophysics. Topics may include nucleosynthesis and stellar evolution, extragalactic distance scale, structure and evolution of galaxies, and large-scale structure of the universe. May be repeated for a maximum of six credits, but only if different topics are covered. *Prq:* ASTR 3020.

AUDIO TECHNOLOGY

Associate Professors: H. Altstatt, B.A. Whisler; *Senior Lecturer:* K.W. Moore

AUD 1850 Introduction to Audio Technology 3 (2) Introduction to MIDI sequencing, analog and digital recording, digital processing and related audio production technologies. Not open to students who have taken MUSC 1850. *Prq:* Production Studies in Performing Arts major. *Coreq:* AUD 1851.

AUD 1851 Introduction to Audio Technology Laboratory 0 (2) Non-credit laboratory to accompany AUD 1850. *Coreq:* AUD 1850.

AUD 1950 Creative Inquiry I 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Prq:* Consent of instructor.

AUD 2790 Audio Practicum 3 (1) Practical work in audio providing technical services to the broader university and surrounding community. Projects include recording live performances, sound support for public events, and audio support for film and animation projects. May be repeated for a maximum of six credits. *Prq:* AUD 3800 with a C or better. *Coreq:* AUD 2791.

AUD 2791 Audio Practicum Laboratory 0 (5) Non-credit laboratory to accompany AUD 2790. *Coreq:* AUD 2790.

AUD 2800 Sound Reinforcement 3 (2) Theory and practice of using audio equipment for amplifying sound in venues ranging from conference rooms to concert halls and sports arenas. *Prq:* Production Studies in Performing Arts major. *Coreq:* AUD 2801.

AUD 2801 Sound Reinforcement Laboratory 0 (2) Non-credit laboratory to accompany AUD 2800. *Coreq:* AUD 2800.

AUD 2850 Acoustics of Music 3 (3) Study of the relationship between the laws of physics and the production of music from an audio engineering perspective. Topics include mechanical and acoustical laws, harmonic analysis, musical scales, sound production in instruments, and the physiology of hearing. *Prq:* Production Studies in Performing Arts major.

AUD 2950 Creative Inquiry II 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Prq:* Consent of instructor.

AUD 3800 Audio Engineering I 3 (2) Intermediate-level course in music technology focusing on digital hard-disk recording and acoustical considerations in audio engineering. *Prq:* PHYS 1220 with a C or better or PHYS 2070 with a C or better; and MUSC 1800 with a C or better or AUD 1850 with a C or better. *Coreq:* AUD 3801.

AUD 3801 Audio Engineering I Laboratory 0 (2) Non-credit laboratory to accompany AUD 3800. *Coreq:* AUD 3800.

AUD 3850 Advanced Live Sound Reinforcement 3 (2) Advanced course in live sound reinforcement focused on digital consoles and sound system design. *Prq:* AUD 2800 with a C or better. *Coreq:* AUD 3851.

AUD 3851 Advanced Live Sound Reinforcement Laboratory 0 (2) Non-credit laboratory to accompany AUD 3850. *Coreq:* AUD 3850.

AUD 3860 Electronic Composition and Sound Design 3 (2) Intermediate- to advanced-level course covering techniques, methods and issues associated with electronic music composition and production. Topics include advanced MIDI/sequencing techniques, electronic orchestral arrangements, scoring/sound design, and picture and audio processing. *Prq:* AUD 1850 or MUSC 1800. *Coreq:* AUD 3861.

AUD 3861 Electronic Composition and Sound Design Laboratory 0 (2) Non-credit laboratory to accompany AUD 3860. *Coreq:* AUD 3860.

AUD 3950 Creative Inquiry III 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of instructor.

AUD 4800* Audio Engineering II 3 (2) Advanced course in music technology focused on music production integrating digital audio and virtual instruments. *Preq:* AUD 2850; and AUD 3800; and PHYS 2080 or PHYS 2210; each with a C or better. *Coreq:* AUD 4801.

AUD 4801* Audio Engineering II Laboratory 0 (2) Non-credit laboratory to accompany AUD 4800. *Coreq:* AUD 4800.

AUD 4850 Production Workshop 3 (2) Project-based course focused on music production. Students produce an audio CD that includes recorded audio tracks and/or newly-created sequenced material with creative and appropriate packaging. *Preq:* AUD 4800 with a C or better. *Coreq:* AUD 4851.

AUD 4851 Production Workshop Laboratory 0 (2) Non-credit laboratory to accompany AUD 4850. *Coreq:* AUD 4850.

AUD 4950 Creative Inquiry IV 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of instructor.

AUD 4990* Independent Study in Audio Technology 1-3 (1-3) Tutorial work for students with special interests in audio study outside the scope of existing courses. May be repeated for a maximum of six credits. *Preq:* Consent of department chair.

ANIMAL AND VETERINARY SCIENCES

Professors: G.P. Birrenkott Jr., A.B. Bodine II; S.K. Duckett, A.K. Greene, J. Jones, T.R. Scott, P.A. Skewes, J. Strickland, *Chair; Associate Professors:* S.L. Pratt, K.L. Vernon; *Assistant Professors:* G. Lascano, N. Long, T. Wilmoth; *Senior Lecturer:* H. Dunn; *Lecturers:* J. Johnson, R. Miller, A.R. Shirley

AVS 1000 Orientation to Animal and Veterinary Sciences 1 (2) Study of the role of animal agriculture in the world today emphasizing supply and demand of end products and careers available in the animal industry.

AVS 1500 Introduction to Animal Science 3 (3) Survey of animal industries and their role in society. Examines the relationship between man and animals in both a current and historical context. *Coreq:* AVS 1510.

AVS 1510 Introduction to Animal Science Laboratory 1 (2) Examines the basic principles in the handling of livestock and techniques of farm animal production as well as orientation to animal production units. *Coreq:* AVS 1500.

AVS 2000 Beef Cattle Techniques 2 (1) Examines basic principles in the techniques and management associated with production of both beef cattle and sheep. Students may take only one techniques course per semester. *Preq or concurrent enrollment:* AVS 1500 and AVS 1510. *Coreq:* AVS 2001.

AVS 2001 Beef Cattle Techniques Laboratory 0 (2) Non-credit laboratory to accompany AVS 2000. *Coreq:* AVS 2000.

AVS 2010 Poultry Techniques 2 (1) Basic principles of the production of poultry are discussed and demonstrated. Students receive hands-on experience in the production and processing of poultry. Students may take only one techniques course per semester. *Preq:* AVS 1510. *Coreq:* AVS 2011.

AVS 2011 Poultry Techniques Laboratory 0 (2) Non-credit laboratory to accompany AVS 2010. *Coreq:* AVS 2010.

AVS 2020 CAFLS Plus 3(2) A professional development course intended for Collage of Agriculture, Forestry and Life Sciences sophomores and juniors who plan to complete an internship, co-op or other external learning experience. Emphasis is placed on understanding personality assessments, leadership styles, negotiation techniques, team dynamics and etiquette. The course is a seminar style course with accompanying laboratory exercises. *Coreq:* AVS 2021.

AVS 2021 CAFLS Plus Laboratory 0(2) Non-credit laboratory to accompany AVS 2020. Students put into practice concepts introduced and discussed in CAFLS Plus lectures. *Coreq:* AVS 2020.

AVS 2030 Dairy Science Techniques 2 (1) Introduction to dairy production and processing. Laboratories include hands-on opportunities for management of dairy cattle, quality control of milk, and processing of milk and dairy products. Students may take only one techniques course per semester. *Preq:* AVS 1510. *Coreq:* AVS 2031.

AVS 2031 Dairy Science Techniques Laboratory 0 (2) Non-credit laboratory to accompany AVS 2030. *Coreq:* AVS 2030.

AVS 2040 Horse Care Techniques 2 (1) Basic principles of equine behavior, handling, and management are discussed and demonstrated. Students receive hands-on experience with various management techniques, including handling and all aspects of health care. Students may take only one techniques course per semester. *Preq:* AVS 1510. *Coreq:* AVS 2041.

AVS 2041 Horse Care Techniques Laboratory 0 (2) Non-credit laboratory to accompany AVS 2040. *Coreq:* AVS 2040.

AVS 2050 Horsemanship Techniques 2 (4) Develops basic to advanced skills based on rider aptitude. Students learn the mechanics of safety, lungeing, basic position, cues, and rider's aids, as well as individual work and building subtlety and finesse with aids. *Preq:* AVS 1510.

AVS 2060 Swine Techniques 2 (1) Examines the basic principles in the techniques and management associated with production of swine. Students may take only one techniques course per semester. *Preq:* AVS 1500 and AVS 1510. *Coreq:* AVS 2061.

AVS 2061 Swine Techniques Laboratory 0 (2) Non-credit laboratory to accompany AVS 2060. *Coreq:* AVS 2060.

AVS 2080 Techniques of Teaching Horsemanship 3 (2) Discusses teaching techniques and theory and handling of large mounted groups. Trains beginner through advanced levels. *Preq:* AVS 2050. *Coreq:* AVS 2081.

AVS 2081 Techniques of Teaching Horsemanship Laboratory 0 (2) Non-credit laboratory to accompany AVS 2080. *Coreq:* AVS 2080.

AVS 2090 Livestock Exhibition Techniques 2 (1) Students learn techniques associated with exhibition and evaluation of beef, dairy, equine, poultry, and swine. *Preq:* AVS 1510. *Coreq:* AVS 2091.

AVS 2091 Livestock Exhibition Techniques Laboratory 0 (2) Non-credit laboratory to accompany AVS 2090. *Coreq:* AVS 2090.

AVS 2110 Meat Processing Techniques 2 (1) Examines the basic principles of food animal processing. Laboratories include hands-on opportunities harvesting a variety of livestock, carcass evaluation, carcass fabrication and value-added meat products. Students also gain understanding in Hazard Analysis and Critical Control (HACCP) certification and meat inspection. *Preq:* AVS 1500. *Coreq:* AVS 2111.

AVS 2111 Meat Processing Techniques Laboratory 0 (2) Non-credit laboratory to accompany AVS 2110. *Coreq:* AVS 2110.

AVS 2120 Small Ruminant Techniques 2 (1) Basic principles of the production of small ruminant animals are discussed and demonstrated. Students receive hands on experience in the management, production and processing of sheep and goats. Activities include handling, health care, lambing or kidding, and fiber, milk and meat production. Students may only take one techniques course per semester. *Preq:* AVS 1510. *Coreq:* AVS 2121.

AVS 2121 Small Ruminant Techniques Laboratory 0 (2) Non-credit laboratory to accompany AVS 2120. *Coreq:* AVS 2120.

AVS 3010 Anatomy and Physiology of Domestic Animals 4 (3) Study of physiology and associated anatomy of the body systems, including nervous, skeletal, muscular, respiratory, digestive, circulatory, urinary, reproductive, and endocrine systems. Designed primarily for students in Animal and Veterinary Sciences. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110. *Coreq:* AVS 3011.

AVS 3011 Anatomy and Physiology of Domestic Animals Laboratory 0 (3) Non-credit laboratory to accompany AVS 3010. *Coreq:* AVS 3010.

AVS 3020 Livestock Selection and Evaluation I 2 (1) Selection and evaluation of the meat species of livestock with application of theory applied in multiple field exercises. *Coreq:* AVS 3021.

AVS 3021 Livestock Selection and Evaluation I Laboratory 0 (2) Non-credit laboratory to accompany AVS 3020. *Coreq:* AVS 3020.

AVS 3090 Principles of Equine Evaluation 2 (4) Discusses the selection and evaluation of equines for various disciplines. Emphasizes current industry standards with regard to form to function. Students place classes of four horses and develop oral reasons to defend their placing. Opportunities for competitive horse judging teams are available.

- AVS 3100 Animal Health 3 (3)** Discusses basic principles of animal health. Emphasizes disease prevention in beef cattle, dairy cattle, goats, horses, poultry, and swine. The most common and important diseases and zoonosis of farm animals are explained. *Preq:* AVS 1500.
- AVS 3110 Dairy Cattle Selection 2 (1)** Dairy selection and evaluation methods are studied, including evaluation according to the Purebred Dairy Cattle Association scorecard, linear evaluation, pedigrees, and Dairy Herd Improvement Association records. Emphasizes presentation of oral reasons. *Coreq:* AVS 3111.
- AVS 3111 Dairy Cattle Selection Laboratory 0 (2)** Non-credit laboratory to accompany AVS 3110. *Coreq:* AVS 3110.
- AVS 3150 Animal Welfare 3 (3)** Discussion of past, present, and future human/animal interaction. Topics include wild animals, domestication, animal welfare organizations, animal rights organizations, welfare assessment, animal agriculture, animal research, and other current topics. *Preq:* Junior standing.
- AVS 3230 Poultry and Poultry Products Evaluation 2 (4)** Selection of layers, broilers, and turkeys. Grading of poultry products according to USDA grade standards is also studied. Students are eligible to compete in intercollegiate poultry judging contests. May be repeated for a maximum of four credits.
- AVS 3600 Internship 1-12 (1-12)** Off-campus, pre-planned, reviewed, approved, and supervised educational experience in an area related to animal and veterinary sciences. Based on a multifaceted work experience in a highly structured professional environment. Students submit periodic written reports and a final written and oral report. To be taken Pass/No Pass only. *Preq:* Consent of instructor.
- AVS 3700 Principles of Animal Nutrition 3 (3)** Familiarizes students with nutrients and feeds used in livestock and specialty animal production. Methods of evaluating common feed-stuffs are covered along with a survey of the functioning of the various digestive systems. Practical aspect to feeding each species is covered. Includes Honors sections. *Preq:* AVS 1500 and CH 1020.
- AVS 3750 Applied Animal Nutrition 3 (2)** Students learn procedures for formulating diets that meet nutrient requirements of livestock and poultry, utilizing traditional mathematical approaches and computerized formulation. Computerized least-cost formulation of diets is covered along with familiarization with feeding systems and approaches. Includes Honors sections. *Preq:* AVS 3700. *Coreq:* AVS 3751.
- AVS 3751 Applied Animal Nutrition Laboratory 0 (2)** Non-credit laboratory to accompany AVS 3750. *Coreq:* AVS 3750.
- AVS 3850 Equine Behavior and Training 2 (6)** Introduces students to the initial processes in gentling and riding young horses. Students work with two- and three-year-old horses to desensitize them to stimuli in preparation for riding. Students do groundwork and put the initial rides on the horses. *Preq:* AVS 2050.
- AVS 3860 Advanced Equine Behavior and Training 2 (6)** Students train young horses advanced skills in western or English disciplines. Students actively prepare horses for show or sale and participate in a show or marketing/sale of their assigned horse. Develops students' negotiation and communication skills, industry insight, and industry-specific jargon. May be repeated for a maximum of four credits. *Preq:* AVS 3850.
- AVS 3900 Practicum 1-3 (1-3)** On-campus, pre-planned, supervised learning experience in an area related to animal and veterinary sciences. Gives experience not covered in other classwork. May be repeated for a maximum of four credits. To be taken Pass/No Pass only. *Preq:* Consent of instructor supervising practicum.
- AVS 4000 Animal and Veterinary Sciences Professional Development 1 (1)** Career development in the animal and veterinary sciences field by resume and interview preparation, learning about career opportunities, and interaction with industry professionals.
- AVS 4010 Beef Production 4 (3)** Discusses breeding, feeding, reproduction, and management of beef cattle. Emphasizes production systems integrating disciplines of animal agriculture into management plans and alternatives. Practical applications of beef production and management practices are also presented. Includes Honors sections. *Preq:* AVS 3700. *Coreq:* AVS 4011.
- AVS 4011 Beef Production Laboratory 0 (2)** Non-credit laboratory to accompany AVS 4010. *Coreq:* AVS 4010.
- AVS 4050 Advanced Selection and Evaluation 2 (4)** Special and advanced training in selection and evaluation of breeding, performance, and market animals or their products. Species used are beef and dairy cattle, sheep, swine, and horses. *Preq:* AVS 3020 or AVS 3090 or AVS 3110 or FDSC 3040; and consent of instructor.
- AVS 4060 Seminars and Related Topics 2 (3)** Students conduct in-depth library research on current topics related to animal science and give formal presentations using multimedia technology. Students also prepare scientific posters, learn interviewing skills, prepare résumés, and observe professional speakers. *Preq:* Senior standing.
- AVS 4090 Selected Topics 1-3 (1-3)** Topics of interest to students at the undergraduate, graduate, and professional levels. Provides experience with problems not covered in other courses or on thesis research. May be repeated for a maximum of six credits, but only if different topics are covered.
- AVS 4100* Domestic Animal Behavior 3 (3)** Provides knowledge and understanding of behavior related to perception, learning, sociality, reproduction, feeding, and health for application in production, training, and design of environments for optimum health and welfare of domestic animals. *Preq:* AVS 1500 and AVS 1510; and Junior standing.
- AVS 4110* Animal Growth and Development 3 (3)** Integration of the nutritional, physiological, and genetic basis for animal growth and development with application to livestock and poultry production. Includes the cellular and molecular mechanisms controlling these processes and emphasizes the genes that regulate animal products (meat, eggs, wool, and milk). *Preq:* AVS 3010.
- AVS 4120* Advanced Equine Management 4 (3)** Further discussion of special considerations of the equine regarding housing, manure management, nutrition, reproduction, transportation, and behavior. Students gain insight into how horses differ from other livestock species and their unique requirements for the above systems. Includes Honors sections. *Preq:* AVS 3700. *Coreq:* AVS 4121.
- AVS 4121* Advanced Equine Management Laboratory 0 (2)** Non-credit laboratory to accompany AVS 4120. *Coreq:* AVS 4120.
- AVS 4130* Animal Products 3 (2)** Introduction to the safe and humane production of red meat, poultry, and dairy products. Includes HACCP principles and production of value-added animal products. *Coreq:* AVS 4131.
- AVS 4131* Animal Products Laboratory 0 (3)** Non-credit laboratory to accompany AVS 4130. *Coreq:* AVS 4130.
- AVS (BIOL, MICR) 4140* Basic Immunology 3 (3)** Introduction to the immune system of vertebrate animals, with an emphasis on structure, function, regulation, and cellular and molecular mechanisms of immune responses. May also be offered as BIOL 4140 or MICR 4140. *Preq:* BIOL 4610 and MICRO 3050.
- AVS 4150* Contemporary Issues in Animal Science 3 (3)** Provides knowledge, understanding, and critical analytical skills on current issues in animal agriculture in diverse regional, national, and global social-cultural and political environments as they impact animals and man. *Preq:* Junior standing.
- AVS 4160* Equine Exercise Physiology 4 (3)** Integration of muscle, bone, cartilage, cardiovascular, and respiratory systems as related to the equine athlete. Encompasses biomechanics, kinetics, and kinesiology related concepts specific to the horse. Further discussion of diseases related to specific systems is covered. *Preq:* AVS 3010. *Coreq:* AVS 4161.
- AVS 4161* Equine Exercise Physiology Laboratory 0 (2)** Non-credit laboratory to accompany AVS 4160. *Coreq:* AVS 4160.
- AVS 4170* Animal Agribusiness Development 2 (1)** Team-based development of a business relating to the animal industries. Students develop the business from the initial idea through operations. Focuses on the development of the business plan, including financials, personnel management, and resources needed. *Preq:* ACCT 2010; and ECON 2110 or ECON 2120. *Coreq:* AVS 4171.
- AVS 4171* Animal Agribusiness Development Laboratory 0 (2)** Non-credit laboratory to accompany AVS 4170. *Coreq:* AVS 4170.
- AVS 4200* Poultry Science On-line 3 (3)** On-line course covering the physiology, nutrition, health, reproduction, genetics, breeding, housing, and management of commercial poultry species, including the processing of meat and egg products.
- AVS 4220 Special Problems 1-3 (1-3)** Laboratory, library, or field study of problems related to animal and veterinary sciences, emphasizing development and testing of hypothesis and reporting of results. May be repeated for a maximum of four credits. *Preq:* Junior standing and consent of instructor supervising study.

AVS (BIOL, MICR) 4240 Immunology Laboratory 1 (3) This course is designed to apply the knowledge gained in MICR 4140, Immunology lecture, in an applied setting. The experiments in this beginning immunology laboratory are designed to study both the innate and acquired immune systems. Experimentation into the formation, function and detection of antibodies provides students with skills in basic immunologic techniques. May also be offered as BIOL 4240 or MICR 4240. *Preq or concurrent enrollment:* MICR 4140.

AVS 4410 Animal and Veterinary Sciences Teaching Experience 1-3 (1-3) Formal teaching experience related to animal and veterinary sciences supervised by a faculty member. May involve classroom instruction, educational material development, and/or student evaluation and assessment. Students submit periodic written reports and a final written and oral report. May be repeated for a maximum of four credits. To be taken Pass/No Pass only. *Preq:* Consent of instructor.

AVS 4420 Animal and Veterinary Sciences Extension Experience 1-3 (1-3) Formal experience in extension education. Students are involved in development, implementation, or assessment of adult or youth educational programs related to animal and veterinary sciences, under supervision of extension professionals. Students submit periodic written reports and a final written and oral report. May be repeated for a maximum of four credits. To be taken Pass/No Pass only. *Preq:* Consent of instructor.

AVS 4430* AVS International Experience 1-3 (1-3) Preplanned and approved international education/cultural experience supervised by an Animal and Veterinary Sciences faculty member. Periodic reports or record keeping are required. Final report and oral presentation are required at the end of the experience. May be repeated for a maximum of four credits. To be taken Pass/No Pass only. *Preq:* Consent of instructor.

AVS 4440 AVS Animal Agribusiness Travel Experience 2 (1) Classroom and travel course to expose students to animal production operations, agribusiness, and industry leaders across various geographical areas. Travel is conducted during spring break and includes visits to farms, universities, and agribusinesses. Additional fee is required. To be taken Pass/Fail only. *Preq:* Junior standing in Animal and Veterinary Sciences and consent of instructor. *Coreq:* AVS 4441.

AVS 4441 AVS Animal Agribusiness Travel Experience Laboratory 0 (2) Non-credit laboratory to accompany AVS 4440. *Coreq:* AVS 4440.

AVS 4500 Sustainable Livestock Production Systems 4 (3) Critical analysis of sustainable livestock production systems and associated factors. Principles of decision making, business analysis, management practices, resource assessment and allocation are covered in a variety of sustainable livestock production schemes. *Coreq:* AVS 4501.

AVS 4501 Sustainable Livestock Production Systems Laboratory 0 (2) Non-credit laboratory to accompany AVS 4500. *Coreq:* AVS 4500.

AVS 4530* Animal Reproduction 3 (2) Reproductive physiology and endocrinology of mammals with emphasis on farm animals and frequent reference to reproduction in laboratory animals and humans. Includes Honors sections. *Preq:* AVS 1500 and AVS 3010. *Coreq:* AVS 4531.

AVS 4531* Animal Reproduction Laboratory 0 (2) Non-credit laboratory to accompany AVS 4530. *Coreq:* AVS 4530.

AVS 4550* Animal Reproductive Management 2 (1) Physiology and endocrinology of pregnant and nonpregnant cows are discussed. Emphasizes methods of artificial insemination, pregnancy detection, and computer record keeping to achieve a high level of reproductive efficiency in cattle. *Preq:* AVS 1500 and AVS 3010. *Preq or concurrent enrollment:* AVS 4530. *Coreq:* AVS 4551.

AVS 4551* Animal Reproductive Management Laboratory 0 (3) Non-credit laboratory to accompany AVS 4550. *Coreq:* AVS 4550.

AVS 4650* Animal Physiology I 3 (3) Advanced study of the physiological systems of domestic animals as these systems relate to the integrated functions of the body. Exposes students to advanced physiological concepts and current literature perspectives on a variety of body systems and processes. Students are expected to have completed introductory coursework in physiology and biochemistry.

AVS 4670* Animal Physiology II 3 (3) Advanced course extending coverage of major and current topics in animal physiology across species not previously covered in AVS 4650. Major topics include digestive physiology in nonruminant and ruminant species, reproductive physiology, muscle physiology, and general aspects of avian physiology. Students are expected to have completed introductory coursework in physiology and biochemistry.

AVS 4700* Animal Genetics 3 (3) Fundamental principles relating to the breeding and improvement of livestock, including variation, heredity, selection, linebreeding, inbreeding, crossbreeding, and other related subjects. Includes Honors sections.

AVS (BIOL) 4800* Vertebrate Endocrinology 3 (3) Introduction to the basic principles of neuroendocrine integration and homeostatic maintenance in vertebrates. Comparative morphology and physiology of various endocrine tissues and hormone chemistry and modes of action are considered. May also be offered as BIOL 4800. *Preq:* BIOL 3030. Students who have not completed BIOL 3030, but who have completed coursework in organic chemistry, may request an override from the instructor.

AVS 4910 Animal and Veterinary Sciences Undergraduate Research Experience 1-3 (1-3) Formal laboratory, library, or field study of problems related to animal and veterinary sciences, emphasizing hypothesis development, testing, and reporting results. Projects are preplanned, reviewed, and approved. Students submit periodic written reports and final written and oral reports. May be repeated for a maximum of four credits. *Preq:* Consent of instructor.

BIOCHEMISTRY

Professors: W. Cao, J. Frugoli, S. Kresovich, H. Luo, W.R. Marcotte, *Chair*; J. Morris, K.S. Smith; *Associate Professors:* F.A. Feltus, A. Lawton-Rauh, H. Liang, K. Paul, M. Sehorn, L.J. Wang; *Assistant Professors:* L.A. Clark, C. Ingram-Smith, L. Kozubowski, M.T. Morris, R. Sekhon; *Lecturers:* S. Chandrasekaran., A. Starr-Moss, K. Tsai

BCHM 1030 Careers in Biochemistry and Genetics 1 (1) Introduces students to biochemistry and genetics career paths, professional organizations, ethical issues, and requirements for advanced study. Also gives students training in design of a professional portfolio. Credit toward a degree will be given for only one of BCHM 1030, GEN 1030. *Preq:* Biochemistry or Genetics major.

BCHM 3010 Molecular Biochemistry 3 (3) Introduces the nature, production, and replication of biological structure at the molecular level and its relation to function. Includes Honors sections. *Preq:* BIOL 1100 with a C or better. *Preq or concurrent enrollment:* CH 2230 with C or better.

BCHM (GEN) 3040 Molecular Biology Laboratory 2 (4) Introduces fundamental molecular biology laboratory techniques commonly used in biochemistry, genetics, and molecular biology research. Principles and applications of these techniques are also discussed. May also be offered as GEN 3040. *Preq:* BIOL 1100. *Preq or concurrent enrollment:* BCHM 3010 or GEN 3020.

BCHM 3050 Essential Elements of Biochemistry 3 (3) Introduction to structure, synthesis, metabolism and function of biomolecules in living organisms. *Preq:* BIOE 1010 or BIOL 1030 or BIOL 1100. *Preq or concurrent enrollment:* CH 2010 or CH 2230.

BCHM 4060* Physiological Chemistry 3 (3) Studies chemical basis of the mammalian physiological processes of muscle contraction, nerve function, respiration, kidney function, and blood homeostasis. Discusses composition of specialized tissue such as muscle, nerve, blood, and bone and regulation of water, electrolytes, and acid-base balance. *Preq:* BCHM 3050 or CH 2230 or CH 2010.

BCHM 4230* Principles of Biochemistry 3 (3) Study of the chemistry of amino acids, monosaccharides, fatty acids, purines, pyrimidines, and associated compounds leads to an understanding of their properties and the relationship between structure and function that makes them important in biological processes. The use of modern techniques is stressed. *Preq:* CH 2240.

BCHM 4310* Physical Approach to Biochemistry 3 (3) Study of chemical and physical properties of amino acids, lipids, nucleic acids, sugars, and their biopolymers. Physical and mathematical analyses are correlated with biological structure and function. Includes Honors sections. *Preq:* BCHM 3010 with a C or better. *Preq or concurrent enrollment:* CH 3300 or CH 3310.

BCHM 4320* Biochemistry of Metabolism 3 (3) Study of the central pathway of carbohydrate, lipid, and nucleotide metabolism. Emphasizes bioenergetics, limiting reactions, and the regulation and integration of the metabolic pathways. Includes Honors sections. *Preq:* BCHM 3010 and BCHM 4310, each with a C or better.

BCHM 4330* General Biochemistry Laboratory I 2 (4) Experiments to illustrate current methods used in biochemical research. *Preq or concurrent enrollment:* BCHM 4310.

BCHM 4340* General Biochemistry Laboratory II 2 (4) Continuation of BCHM 4330. *Preq:* Concurrent enrollment in BCHM 4320.

BCHM 4360* Molecular Biology: Genes to Proteins 3 (3) Examines how nucleic acids and proteins are synthesized in prokaryotic and eukaryotic cells. Designed for students interested in biochemistry, cell biology, molecular biology, and cell physiology. Includes Honors sections. *Preq:* BCHM 3010 and GEN 3020, each with C or better.

BCHM (GEN) 4400* Bioinformatics 3 (3) Theory and application of computational technology to analysis of the genome, transcriptome, and proteome. Includes Honors sections. May also be offered as GEN 4400. *Preq:* BCHM 3010 or BCHM 3050 or GEN 3000 or GEN 3020; each with C or better.

BCHM 4430* Molecular Basis of Disease 3 (3) Topics in heritable human metabolic disorders, including clinical features and newborn screening, genetic testing, the biochemical basis, and treatment. *Preq:* BCHM 3010 or BCHM 3050 or GEN 3000 or GEN 3020; each with a C or better.

BCHM 4900 Selected Topics in Biochemistry 1-4 (1-4) Comprehensive study of selected topics not covered in other courses. May be repeated for a maximum of eight credits, but only if different topics are covered. *Preq:* Consent of instructor.

BCHM 4910 Directed Research in Biochemistry 1-8 (3-24) Orientation in biochemical research (i.e., experimental planning, execution, and reporting). May be repeated for a maximum of 20 credits. Includes Honors sections. *Preq:* Consent of instructor.

BCHM 4920 Honors Thesis in Biochemistry 1 (1) Students complete a senior thesis and oral presentation detailing their honors research in biochemistry. *Preq or concurrent enrollment:* Students are expected to have completed or be concurrently enrolled in their second semester of an Honors section of BCHM 4910 for a minimum of four credits when registering for this course.

BCHM 4930 Senior Seminar 2 (2) Analysis and discussion of papers from the primary literature in the life sciences particularly in biochemistry. Students find pertinent articles in the primary literature and present and analyze the selected reading. Includes Honors sections. *Preq:* BCHM 3010 and GEN 3020, each with a C or better; and one of BCHM 4310 or BCHM 4320 or BCHM 4360 with a C or better.

BIOSYSTEMS ENGINEERING

Professor: T.H. Walker; *Associate Professors:* C.M. Drapcho, T.O. Owino; *Assistant Professors:* C. Darnault, Y. Zheng,

BE 1990 Creative Inquiry—Biosystems Engineering I 1-3 (1-3) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be taken twice for a maximum of six credits. To be taken Pass/No Pass only.

BE 2100 Introduction to Biosystems Engineering 2 (1) Overview of topics and engineering application areas that comprise the biosystems engineering profession. Significant emphasis is also given to development of oral and written communication skills needed by the engineering professional, introduction to design methodology, and application of engineering fundamentals to biological systems. *Preq or concurrent enrollment:* ENGR 1070. *Coreq:* BE 2101.

BE 2101 Introduction to Biosystems Engineering Laboratory 0 (3) Non-credit laboratory to accompany BE 2100. *Coreq:* BE 2100.

BE 2120 Fundamentals of Biosystems Engineering 2 (1) Introduction to fundamental concepts in biosystems engineering, including mass, energy, and momentum balances; mass, heat, and momentum transfer; biological response to environmental variables, biological materials, biological kinetics, and techniques of measurement and analysis of engineering and biological data. Laboratory includes hand-on exercises, problem solving and computer sessions, and oral presentations. *Preq or concurrent enrollment:* MATH 1060 and ENGR 1070. *Coreq:* BE 2121.

BE 2121 Fundamentals of Biosystems Engineering Laboratory 0 (3) Non-credit laboratory to accompany BE 2120. *Coreq:* BE 2120.

BE 2990 Creative Inquiry—Biosystems Engineering II 1-3 (1-3) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be taken twice for a maximum of six credits. To be taken Pass/No Pass only.

BE 3000 Biosystems Engineering Honors Seminar 0 (0) Introduces undergraduate students to current faculty research. Project ideas are then developed to prepare students in choosing a research topic for the senior honors thesis. Students are required to attend senior honors thesis presentations. To be taken Pass/No Pass only. *Preq:* Junior standing in departmental honors program.

BE 3010 Biosystems Engineering Honors Thesis Research 3 (6) Honors thesis project proposal, initial research, report, and presentation of biosystems engineering project for completion of junior requirements of the Biosystems Engineering Honors program. *Preq:* BE 3000.

BE 3140 Biosystems Engineering Mechanical Design 3 (3) Study of basic mechanical design of biosystems. Includes an introduction to biomechanics and biomaterial properties. Studies applications of machine components and their selection related to specific types of biosystems. Team design project is required. *Preq:* CE 2060 or ME 3020.

BE 3200 Principles and Practices of Geomatics 3 (2) Basic surveying measurements and computations for engineering project control, mapping, and construction layout. Leveling, earthwork, area, and topographic measurements using levels, total stations and GPS. Application of Mapping via GIS. *Preq:* MATH 1060. *Coreq:* BE 3201.

BE 3201 Principles and Practices of Geomatics Laboratory 0 (3) Non-credit laboratory to accompany BE 3200. *Coreq:* BE 3200.

BE 3220 Small Watershed Hydrology and Sedimentology 3 (3) Fundamental relationships governing rainfall disposition are used as bases for defining the hydrology of watersheds. Emphasizes application of modeling techniques appropriate for runoff and sediment control. *Preq or concurrent enrollment:* CE 3410.

BE 3700 Practicum 1-3 (1-3) Preplanned internship with an approved employer involved with biosystems engineering endeavors. A minimum 1300 hours of supervised responsibility is required per credit hour. Evaluation is based on activity journal, written/oral report, and an evaluation from the supervisor. May be repeated for a maximum of three credits. To be taken Pass/No Pass only. *Preq:* Junior standing and consent of department.

BE 3990 Creative Inquiry—Biosystems Engineering III 1-3 (1-3) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be taken twice for a maximum of six credits. To be taken Pass/No Pass only.

BE 4000 Biosystems Engineering Honors Thesis 3 (6) Individual research projects are conducted under the supervision and guidance of a faculty member. Senior honors thesis is required. *Preq or concurrent enrollment:* BE 3010.

BE (PES) 4080* Land Treatment of Wastewater and Sludges 3 (3) Principles for designing environmentally acceptable land application systems using municipal and industrial wastewater and sludges are presented. Topics include land-limiting constituent analysis; soil-plant interactions; system equipment and design; system operation and management; public acceptance, social, and regulatory issues. Case studies and field trips are planned. May also be offered as PES 4080. *Preq:* Senior standing.

BE 4100* Biological Kinetics and Reactor Modeling 3 (2) Fundamentals of microbial and biochemical kinetics used in analysis and design of biological systems. Topics include mathematical and computer modeling of biological kinetics and systems, estimating model coefficients, and development of microbial kinetic models as basis for batch and continuous reactor design. *Preq:* BE 2120. *Preq or concurrent enrollment:* MATH 2080. *Coreq:* BE 4101.

BE 4101* Biological Kinetics and Reactor Modeling Laboratory 0 (3) Non-credit laboratory to accompany BE 4100. *Coreq:* BE 4100.

BE 4120* Heat and Mass Transport in Biosystems Engineering 3 (3) Fundamentals of heat and mass transport used in engineering design and analysis of biological systems; principles of steady state and transient energy and mass balances, including chemical and biological generation terms. *Preq:* BE 4100.

BE 4140 Biosystems Engineering Unit Operations 3 (2) Applies the basic principles of statics, dynamics, and thermodynamics to design of mechanical and electrical systems supporting biological operations and processes. *Preq:* BE 3140 and ME 3100. *Coreq:* BE 4141.

BE 4141 Biosystems Engineering Unit Operations Laboratory 0 (3) Non-credit laboratory to accompany BE 4140. *Coreq:* BE 4140.

- BE 4150* Instrumentation and Control for Biosystems Engineers 4 (3)** Overview of modern instrumentation techniques and digital electronic components and subsystems to integrate them into digital data acquisition and control systems for biosystems. Laboratory use of equipment is emphasized. Topics include characteristics of instruments, signal conditioning, transducer theory and applications, programmable logic controllers, and digital data acquisition and control. *Preq or concurrent enrollment:* ECE 2070. *Coreq:* BE 4151.
- BE 4151* Instrumentation and Control for Biosystems Engineers Laboratory 0 (3)** Non-credit laboratory to accompany BE 4150. *Coreq:* BE 4150.
- BE 4170* Applied Instrumentation and Control for Biosystems 2 (1)** Hardware and software implementation of digital data acquisition and control systems for application to agriculture, aquaculture, biotechnology, and other biosystems. Topics include digital electronic circuits and components, microcomputer architecture, interfacing, and programming. *Preq:* BE 4150. *Coreq:* BE 4171.
- BE 4171* Applied Instrumentation and Control for Biosystems Laboratory 0 (3)** Non-credit laboratory to accompany BE 4170. *Coreq:* BE 4170.
- BE 4210 Engineering Systems for Soil Water Management 2 (1)** Presents fundamentals of design related to drainage of lands, irrigation, and modification of the microenvironment for optimum productivity. *Preq or concurrent enrollment:* CE 3410 and MATH 2080. *Coreq:* BE 4211.
- BE 4211 Engineering Systems for Soil Water Management Laboratory 0 (3)** Non-credit laboratory to accompany BE 4210. *Coreq:* BE 4210.
- BE 4220* Hydrologic Modeling of Small Watersheds 3 (3)** Design of structures and development of best management practices for runoff, flood, and sediment control from rural and urban areas, including natural and disturbed watersheds. Topics include modeling of prismatic and non-prismatic channels, culverts, and detention/retention ponds. *Preq:* BE 3220.
- BE 4240 Ecological Engineering 3 (3)** Focuses on engineering solutions to environmental and socioeconomic problems using ecological design principles. Explores ecosystem processes as they pertain to sustainable development, natural resource protection, food and energy production, waste management, and environmental restoration. Engineering fundamentals and ecological modeling are integral components of this course.
- BE 4280* Biochemical Engineering 3 (3)** Use of microorganisms and enzymes for the production of chemical feedstocks, single-cell protein, antibiotics, and other fermentation products. Topics include kinetics and energetics of microbial metabolism, design and analysis of reactors for microbial growth and enzyme-catalyzed reactions, and considerations of scale-up, mass transfer, and sterilization during reactor design. *Preq or concurrent enrollment:* BE 4100 or CHE 3300.
- BE 4350* Applications in Biotechnology Engineering 3 (2)** Bioengineering principles applied to the expanding fields of agricultural biotechnology, ecotechnology, and biomedical technology. Specific applications include waste treatment and ecological engineering, bioreactor propagation of plant and animal cells and tissues, applied genomics and synthetic seed production, biosensors and biomonitoring, biological implants and materials biocompatibility. *Preq:* BE 4280 or CHE 4280. *Coreq:* BE 4351.
- BE 4351* Applications in Biotechnology Engineering Laboratory 0 (3)** Non-credit laboratory to accompany BE 4350. *Coreq:* BE 4350.
- BE 4380* Bioprocess Engineering Design 3 (2)** Design and analysis of systems for processing biological materials. Topics include biotechnology, thermodynamics, transport processes, and biological properties related to bioprocess design and computational simulation. Unit operations include basic bioreactor operation, bioseparations, and preservation techniques. *Preq or concurrent enrollment:* BE 4100 or CHE 3300 or EES 4020. *Coreq:* BE 4381.
- BE 4381 Bioprocess Engineering Design Laboratory 0 (2)** Non-credit laboratory to accompany BE 4380. *Coreq:* BE 4380.
- BE (CE) 4400* Sustainable Energy Engineering 3 (2)** Investigation into merging renewable energy resources, including detailed study of solar, wind, and bioenergy alternatives. Also includes principles, technologies, and performance evaluation of components for these technologies and an introduction to tidal, hydro, geothermal, and other energy; energy conservation; cogeneration; financial, economical, and other issues related to alternative energy sources. May also be offered as CE 4400. *Preq:* Junior standing in an engineering major. *Coreq:* BE 4401.
- BE (CE) 4401* Sustainable Energy Engineering Laboratory 0 (2)** Non-credit laboratory to accompany BE 4400. May also be offered as CE 4401. *Coreq:* BE 4400.
- BE (EES, FOR) 4510* Newman Seminar and Lecture Series in Natural Resources Engineering 1 (2)** Topics dealing with development and protection of land, air, water, and related resources are covered by seminar with instructor and invited lecturers. Current environmental and/or resource conservation issues are addressed. Includes Honors sections. May also be offered as EES 4510 or FOR 4510. *Preq:* Senior standing.
- BE 4640* Non-Point Source Management in Engineered Ecosystems 3 (2)** Fundamentals of non-point source pollution, including quantification of environmental impact and ecosystem management related to contaminants and nutrients and to planning and design of ecological systems. *Preq:* MICR 3050 and Senior standing in engineering. *Coreq:* BE 4641.
- BE 4641* Non-Point Source Management in Engineered Ecosystems Laboratory 0 (3)** Non-credit laboratory to accompany BE 4640. *Coreq:* BE 4640.
- BE 4730 Special Topics in Biosystems Engineering 1-3 (1-3)** Comprehensive study of special topics not covered in other courses. Emphasizes independent pursuit of detailed investigations. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Consent of instructor.
- BE 4740 Biosystems Engineering Design/Project Management 2 (1)** Study of biological systems design using hydrology principles, fluid mechanics, bioprocessing, heat/mass transfer, instrumentation, mechanical unit operations, and structural principles for project design, scheduling, and cost estimation. Topics also include engineering ethics, professional development, written and oral communication, and job skills. Senior portfolios are also developed. *Preq:* Senior standing in Biosystems Engineering. *Coreq:* BE 4741.
- BE 4741 Biosystems Engineering Design/Project Management Laboratory 0 (3)** Non-credit laboratory to accompany BE 4740. *Coreq:* BE 4740.
- BE 4750 Biosystems Engineering Capstone Design 2 (4)** Applications of hydrology, fluid mechanics, bioprocessing, heat/mass transfer, instrumentation, mechanical unit operations, and structural principles in design; project scheduling; cost estimation; ethics; environmental and social impacts; design drawings; and report documentation. *Preq:* Senior standing in Biosystems Engineering.
- BE (EES) 4840* Municipal Solid Waste Management 3 (3)** Introduction to the problems, regulations, collection, handling, recycling, and disposal of municipal solid wastes in the urban and rural sectors. Emphasizes an integrated waste-management system with resource recovery, composting, incineration, landfill disposals, and their costs. May also be offered as EES 4840. *Preq:* EES 2020 or EES 4010.
- BE 4990 Creative Inquiry—Biosystems Engineering IV 1-3 (1-3)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be taken twice for a maximum of six credits. To be taken Pass/No Pass only.

BIOENGINEERING

Professors: R.W. Blob, R.L. Dooley, R. Figliola, A. Guiseppi-Elie, S.W. Harcum, M. LaBerge, *Chair*; R.A. Latour Jr., N.R. Vyavahare, G. Zhang; *Associate Professors:* L. Benson, D. Dean, J. DesJardins, B.Z. Gao, J. Nagatomi, D. Simionescu, A. Vertegel, C.K. Webb, H. Yao; *Assistant Professors:* F. Alexis, A. Foley, M. Harman, D. Kwartowitz, J. Lee, Y. Mei, J. Mercuri, A. Simionescu, T. Ye

BIOE 1010 Biology for Bioengineers 1 (1) Provides basic introduction to fundamental principles of molecular and cellular biology. *Preq:* CH 1010.

BIOE 2000 Bioengineering Professional Development 0 (1) Provides an introduction to the professional opportunities available for bioengineering students. Students learn best practices and prepare for a bioengineering career. To be taken Pass/No Pass only. *Preq:* Sophomore standing in bioengineering.

- BIOE 2010 Introduction to Biomedical Engineering 3 (3)** Provides engineering, biological, and physical science students with an overview of the replacement of human body parts and the problems related to artificial devices. *Preq:* CH 1020; and one of BIOE 1010 or BIOL 1030 or BIOL 1100.
- BIOE 3000 Bioengineering Ethics and Entrepreneurship 0 (1)** Introduction to the ethical considerations of performing human and animal research in support of medical technology development. Students are exposed to fundamental business concepts related to translating technology to the marketplace. To be taken Pass/No Pass only. *Preq:* BIOE 2000.
- BIOE 3020 Biomaterials 3 (2)** Study of metallic, ceramic, and polymer materials used for surgical and dental implants; materials selection, implant design, physical and mechanical testing; corrosion and wear in the body. In addition, physical and mechanical properties of tissue as related to microstructure are studied. *Preq:* BIOE 2010 and MSE 2100; and either both CH 2010 and CH 2020 or both CH 2230 and CH 2270. *Coreq:* BIOE 3021.
- BIOE 3021 Biomaterials Laboratory 0 (3)** Non-credit laboratory to accompany BIOE 3020. *Coreq:* BIOE 3020.
- BIOE 3200 Biomechanics 3 (3)** Study of relation between biological and mechanical functions of musculoskeletal tissues such as bone, ligaments, muscles, cartilage, etc.; mechanics of human joints; analysis of implants and implant failure. *Preq:* CE 2010 and MATH 2080.
- BIOE 3210 Biofluid Mechanics 3 (3)** Introduces mechanics of biological fluids (e.g., blood, synovial fluid and physiological solutions) with an emphasis on the formation of biological problems within the context of (1) kinematics, (2) the concept of stress, (3) linear momentum balance, (4) constitutive relations and (5) boundary conditions. *Preq:* CE 2010 and MATH 2080.
- BIOE 3700 Bioinstrumentation and Bioimaging 3 (2)** Introduction of fundamental topics in bioinstrumentation and bioimaging focused on the acquisition and monitoring of vital signals. Basic principles for the selection and appropriate use of instruments for solving bioengineering and medical problems such as microscopy, magnetic resonance imaging, and ultrasounds, among others, are addressed. *Preq:* MATH 2080; and ECE 2020 or ECE 2070. *Coreq:* BIOE 3701.
- BIOE 3701 Bioinstrumentation and Bioimaging Laboratory 0 (3)** Non-credit laboratory to accompany BIOE 3700. *Coreq:* BIOE 3700.
- BIOE 4000 Bioengineering Leadership and MedTech Commercialization 1 (1)** Introduction to common leadership techniques and managerial approaches. Students are exposed to various product/technology valuation techniques that contribute to how business decisions are made in the MedTech sector. To be taken Pass/No Pass only. *Preq:* BIOE 3000.
- BIOE 4010 Bioengineering Design Theory 3 (3)** Introduces principles of engineering design and applies them to the design of medical devices. Covers materials selection, fabrication processes, performance standards, cost analysis, and design optimization. Students defend a design project proposal in written and oral form before a faculty jury. *Preq:* BIOE 3020 or BIOE 3700 or BIOE 3200.
- BIOE 4020 Biocompatibility 3 (2)** Guides students through the theory and practice of determining compatibility of biomaterials and medical devices as required by the FDA. Hands-on experiments emphasize host-implant interactions such as toxicity towards tissues using specific techniques, including cell culture, implantation of biomaterials in experimental animals and histopathology. *Preq:* BIOE 3020 and BIOL 4610. *Coreq:* BIOE 4021.
- BIOE 4021 Biocompatibility Laboratory 0 (3)** Non-credit laboratory to accompany BIOE 4020. *Coreq:* BIOE 4020.
- BIOE 4030 Applied Biomedical Design 3 (1)** Creative application of bioengineering and design principles to solving clinically relevant design problems. Team-based development, construction and evaluation of design prototypes in accordance with design theory. Students present results to faculty jury and external collaborators through written reports and oral presentations. *Preq:* BIOE 4010. *Coreq:* BIOE 4031.
- BIOE 4031 Applied Biomedical Design Laboratory 0 (6)** Non-credit laboratory to accompany BIOE 4030. *Coreq:* BIOE 4030.
- BIOE 4120* Orthopaedic Engineering and Pathology 3 (3)** Interdisciplinary study of clinical orthopaedic cases (bone growth, bone remodeling, osteoarthritis, implant fixation and joint replacements); biomechanical, biomaterials, tribology and clinical diagnosis of failed implants (total joint replacements, fracture fixation and spinal instrumentation); basic concepts of orthopaedic pathology for engineers. *Preq:* BIOE 3020 and BIOE 3200; *Preq or concurrent enrollment:* BIOL 3150.
- BIOE 4150* Research Principles and Concepts 1 (1)** Introduces seniors and graduate students to principles and practices of scientific research. Topics include developing scientific concepts, developing projects, pursuing research, collaborating in multidisciplinary teams, patenting and publishing technical and scientific information, and reviewing professional and ethical standards of performance. Includes Honors sections.
- BIOE 4200 Sports Engineering 3 (3)** Study of engineering principles involved in sports: body systems in human motion, analysis of gait, basic performance patterns in athletic movements, performance improvements, design of sports equipment. *Preq:* BIOE 3020 and BIOE 3200.
- BIOE 4230* Cardiovascular Engineering and Pathology 3 (3)** Medical and bioengineering aspects of artificial cardiovascular and vascular devices; physiology and pathological aspects of patients with need for such devices; diagnostic techniques and surgical management of diseases and pathology; design aspects of current devices and selection; state of the art in experiments and human clinical trials. *Preq:* BIOE 3020 and BIOE BIOL 3150; and either BIOE 3200 or BIOE 3210.
- BIOE 4310* Medical Imaging 3 (2)** Introduction to the history, physics, and basis of medical imaging devices; including X-ray, Computed Tomography, Magnetic Resonance Imaging, and Ultrasound. Students will understand imaging from both an engineering and clinical perspective. Students will have the opportunity to work with real medical-images, to understand the trade-offs between modalities. *Preq:* MATH 2080; and one of ECE 2020 or ECE 2070. *Preq or concurrent enrollment:* BIOE 3700. *Coreq:* BIOE 4311.
- BIOE 4311* Medical Imaging Laboratory 0 (2)** Non-credit laboratory to accompany BIOE 4310. *Coreq:* BIOE 4310.
- BIOE 4350* Computer Modeling of Multiphysics Problems 3 (3)** This course will introduce students to a holistic way to deal with complicated engineering problems using a computer modeling approach. For example, a real-world problem governed by combined mechanical, electrical, thermal, electrochemical and mass-transport phenomena will be dealt with in an integrated and multidisciplinary way rather than the conventional piece-wise single-discipline way. *Preq:* MATH 2080.
- BIOE 4400* Biopharmaceutical Engineering 3 (3)** This course examines the design principles necessary to use bacteria, fungi, and mammalian cells in bioengineering applications, including molecular techniques, fermentation, process scale-up, purification processes, and FDA regulations. The production of biopharmaceuticals derived from recombinant systems, including uses in medical systems, is emphasized. *Preq:* BCHM 3050.
- BIOE 4480 Tissue Engineering 3 (2)** Explores the application of engineering principles toward the development of biologically based substitutes that restore, maintain, or improve tissue function. Topics include biodegradable scaffolds, wound healing and tissue repair, cell-matrix interactions, immunology and biocompatibility, stem cells. *Preq:* BIOE 3020 and BIOL 3150. *Preq or concurrent enrollment:* BIOL 4610. *Coreq:* BIOE 4481.
- BIOE 4481 Tissue Engineering Laboratory 0 (3)** Non-credit laboratory to accompany BIOE 4480. *Coreq:* BIOE 4480.
- BIOE 4490 Drug Delivery 3 (3)** Fundamental principles of controlled drug delivery including drug release mechanisms, physiological barriers, and various types of delivery routes. Specific emphasis is placed on understanding drug delivery technologies and processes to scale up the fabrication of drug delivery systems. *Preq:* BIOE 3020.
- BIOE 4500 Special Topics in Bioengineering 1-4 (1-4)** Comprehensive study of a topic of current interest in the field of biomedical engineering under the direct supervision and guidance of a faculty member. May be repeated for a maximum of six credits, but only if different topics are covered. Includes Honors sections. *Preq:* Consent of instructor.
- BIOE 4510 Creative Inquiry—Bioengineering 1-3 (1-3)** Disciplinary and multidisciplinary team research projects with the goal of developing the students' skills in literature research, engineering design, and data analysis. May be repeated. *Preq:* Consent of instructor.

- BIOE 4600 International Bioengineering Research Topics 1-6 (1-6)** Comprehensive study and research exposure relating to bioengineering research topics at an international institution through the Bioengineering study abroad program. Students are exposed to laboratory and research methods while under the direct supervision and guidance of approved international mentors. May be repeated for a maximum of six credits. Includes Honors sections. *Preq:* Consent of instructor.
- BIOE 4610 International Study in Bioengineering 3 (3)** Introduction to selected bioengineering topics through participation in international study abroad summer programs. Offers an international study experience to undergraduates through lectures, guest speakers, tours, and/or laboratory exposure on a selected bioengineering topic chosen annually by the department. *Preq:* Consent of instructor.
- BIOE 4690 International Bioengineering Internship 1-3 (1-3)** Observation and assignment in an international medical school, dental school, hospital, regulatory agency, or industrial department. Course is affiliated with the bioengineering study abroad program and students are under the direct supervision and guidance of approved international mentors. May be repeated for a maximum of six credits. *Preq:* Consent of instructor.
- BIOE 4710* Biophotonics 3 (3)** Biophotonics is an interdisciplinary subject of applying photonics to study biological samples from individual cells to the entire body. Introduces fundamental and frontier topics in optical imaging aspects of biophotonics for senior-level undergraduates and graduate students to gain the ability to solve bioimaging-related biomedical problems. *Preq:* MATH 2080; and PHYS 2210; and either ECE 2070 or ECE 3200.
- BIOE 4760 Biosurface Engineering 3 (2)** Study of how surface design influences the interactions of biomolecules with biomaterials and how this in turn influences implant biocompatibility. Laboratory addresses both the theory and application of various analytical instruments commonly used in bioengineering to characterize biomaterials surfaces and investigate biomolecule-surface interactions. *Preq:* Senior standing in Bioengineering and BCHM 3050. *Coreq:* BIOE 4761.
- BIOE 4761 Biosurface Engineering Laboratory 0 (3)** Non-credit laboratory to accompany BIOE 4760. *Coreq:* BIOE 4760.
- BIOE 4820* Biomaterial Implantology 3 (2)** Provides training in the planning and conduct of experimental surgery, including laws and regulations; institutional requirements; selection of animal models; ethical considerations of animal research; preparation of animals for surgery; general and special surgical techniques; aseptic surgical techniques; and basic and applied instrumentation. *Preq:* Junior standing in Bioengineering. *Coreq:* BIOE 4821.
- BIOE 4821* Biomaterial Implantology Laboratory 0 (3)** Non-credit laboratory to accompany BIOE 4820. *Coreq:* BIOE 4820.
- BIOE 4900 Internship 1 (3)** Observation and assignment in a medical school, dental school, hospital, regulatory agency, or industrial department. May be repeated for a maximum of two credits. To be taken Pass/No Pass only. *Preq:* Senior standing in Bioengineering and consent of department chair.
- BIOE 4910 Mentored Research in Bioengineering 1-6 (1-6)** Mentored research training for undergraduate students working with a faculty advisor, including literature review, experimental design, research documentation, and presentation of results. May be repeated. Honors students must take six credits under a single advisor and write an honors thesis. Includes Honors sections. *Preq:* Consent of instructor.
- BIOLOGY**
- Professors:* P.H. Adler, L.J. Bain, W.S. Baldwin, R.E. Ballard, R.W. Blob, W. Chen, R.S. Cohen, *Chair*; G.W. Eidson, V.S. Gallicchio, S.J. Klaine, R.J. Kosinski, M.B. Pracek, C.D. Rice, B.J. Speziale, T.P. Spira, W.M. Surver, L.A. Temesvari, Y. Wei; *Associate Professors:* D.G. Bielenberg, S.C. Chapman, M.J. Childress, S.J. DeWalt, Y. Dong, J.J. Hains, A.S. Mount, S.A. Sparace, D.W. Tonkyn, M.W. Turnbull, P. van den Hurk, C.E. Wells, X. Yu; *Assistant Professors:* J. A. Baeza, D. Dittrich-Reed, N.R. Espinoza, D.M. Feliciano, K.L. Ickes, J.L. Kerrigan, L.G. Rapaport, M.W. Sears; *Senior Lecturers:* J.R. Cummings, R.C. Hardwick, T. Kaisa, T.L. McNutt-Scott, V.C. Minor, D.R. Weinbrenner
- BIOL 1010 Frontiers in Biology I 1 (1)** Introduces Biological Sciences majors to University career and library services, evaluation of computer program proficiency, Web page development, Biological Sciences emphasis areas, and Biological Sciences faculty. Students initiate their own Web-based student portfolios, which showcase their skills and experiences (e.g., résumés, accomplishments, and work samples) during their undergraduate programs.
- BIOL 1030 General Biology I 3 (3)** First in a two-semester sequence. Includes an evolutionary approach to cells, cellular activities, genetics, and animal diversity emphasizing the processes of science. Credit toward a degree will be given for BIOL 1030 or 1100 only. Includes Honors sections.
- BIOL 1040 General Biology II 3 (3)** Continuation of BIOL 1030. Includes an evolutionary approach to human anatomy and physiology, plant diversity, morphology, and physiology and principles of ecology. Credit toward a degree will be given for BIOL 1040 or 1110 only. Includes Honors sections. *Preq:* BIOL 1030 and BIOL 1050; or BIOL 1100.
- BIOL 1050 General Biology Laboratory I 1 (3)** Laboratory to accompany BIOL 1030. Emphasizes developing laboratory techniques, becoming familiar with biological instrumentation, and performing investigations and interpreting results in the areas of biochemistry, cell biology, and molecular biology. *Preq or concurrent enrollment:* BIOL 1030.
- BIOL 1060 General Biology Laboratory II 1 (3)** Laboratory to accompany BIOL 1040. Emphasizes developing laboratory techniques, becoming familiar with biological instrumentation, and performing investigations and interpreting results in the areas of organismal structure, physiology, and ecology. *Preq or concurrent enrollment:* BIOL 1040.
- BIOL 1090 Introduction to Life Science 4 (3)** Survey of topics in botany, zoology, microbiology, and ecology emphasizing comprehension and practical application of life-science concepts to experiments and activities for the elementary school classroom. Enrollment priority will be given to Early Childhood and Elementary Education majors. *Coreq:* BIOL 1091.
- BIOL 1091 Introduction to Life Science Laboratory 0 (3)** Non-credit laboratory to accompany BIOL 1090. *Coreq:* BIOL 1090.
- BIOL 1100 Principles of Biology I 5 (4)** Introductory course designed for students majoring in biological disciplines. Integrates lecture and laboratory and emphasizes a modern, quantitative, and experimental approach to explanations of structure, composition, dynamics, interactions, and evolution of cells and organisms. High school chemistry is recommended. Credit toward a degree will be given for BIOL 1100 or 1030 only. Includes Honors sections. *Coreq:* BIOL 1101.
- BIOL 1101 Principles of Biology I Laboratory 0 (3)** Non-credit laboratory to accompany BIOL 1100. *Coreq:* BIOL 1100.
- BIOL 1110 Principles of Biology II 5 (4)** Continuation of BIOL 1100, emphasizing the study of plants and animals as functional organisms and the principles of ecology. Credit toward a degree will be given for BIOL 1110 or 1040 only. Includes Honors sections. *Preq:* BIOL 1100. *Coreq:* BIOL 1111.
- BIOL 1111 Principles of Biology II Laboratory 0 (3)** Non-credit laboratory to accompany BIOL 1110. *Coreq:* BIOL 1110.
- BIOL 1200 Biological Inquiry Laboratory 1 (3)** Required laboratory experience to accompany BIOL 1220 or 1230. Focuses on the process and outcomes of scientific inquiry. Students employ scientific methodology in a laboratory environment as well as critical analysis of biological problems in a small group context. *Preq or concurrent enrollment:* BIOL 1220 or BIOL 1230.
- BIOL 1220 Keys to Biodiversity 3 (3)** Introduction to scientific inquiry through analysis of biodiversity. Biological foundations for life are studied, including evolution, ecology, genetics, cells, and molecules. Also includes discussion of ethical issues related to biodiversity. Credit toward a degree will be given for only one of BIOL 1220 or 1230.
- BIOL 1230 Keys to Human Biology 3 (3)** Introduction to scientific inquiry through human biology. Considers biological processes occurring within humans and human impact on global biological processes. Interrelationships ultimately affecting evolution and diversity are explored. Credit toward a degree will be given for only one of BIOL 1220 or BIOL 1230.
- BIOL 1910 Directed Research 1-3 (3-9)** Research projects, supervised by faculty in the College of Agriculture, Forestry and Life Sciences introducing research methods. Restricted to outstanding high school students, selected using Governor's School for Science and Mathematics ranking criteria. May be repeated for a maximum of six credits. *Preq:* Entering high school junior or senior status and consent of faculty research supervisor and department in which research is conducted.

- BIOL 2000 Biology in the News 3 (3)** For non-science majors. Students examine current topics of biology appearing in newspapers and other current media. Uses a problem-based learning approach, with students working as teams and individually on areas of interest identified by the class. Students are expected to have completed the General Education Natural Science Requirement prior to enrolling in this course. *Preq:* ENGL 1030.
- BIOL 2010 Biotechnology and Society 3 (3)** Introduction to the theories, fields, and applications of biotechnology, including the structure and function of genes and their manipulation to improve plant and animal productivity and human health. Individual case studies are examined, including social and ethical issues surrounding biotechnology-based research and development. Not open to Genetics majors. *Preq:* BIOL 1200; and one of BIOL 1220 or BIOL 1230; and General Education Natural Science requirement.
- BIOL 2030 Human Disease and Society 3 (3)** Focuses on the basic biology underlying human disease, how disease is understood, and current methods of prevention and treatment of disease. The economics as well as the social and ethical issues surrounding human disease are a common thread throughout the course. *Preq:* Both BIOL 1040 and BIOL 1060; or BIOL 1110; or BIOL 1220; or BIOL 1230.
- BIOL 2040 Environment, Energy and Society 3 (3)** Examines power and energy production, the resultant environmental effects, and the relationship between this technology and society. Introduces historical and contemporary sources of energy and power; the economic, social, and political forces important for types and patterns of development; and the resultant impacts to ecosystems and the environment.
- BIOL 2050 Plant Form and Function 3 (3)** Introductory course for students majoring in plant sciences. Integrates lecture and laboratory and emphasizes fundamental structures and functions of higher plants. *Preq:* BIOL 1030 and BIOL 1050.
- BIOL 2060 Plant Form and Function Laboratory 1 (1)** Laboratory for BIOL 2050. *Preq or concurrent enrollment:* BIOL 2050.
- BIOL 2100 Evolution and Creationism 3 (3)** Critical review of the scientific and technological basis for evolutionary theory compared to creationist explanations for the origin and diversity of life. Includes a historical survey of the impact that the evolution/creation debate has had on law, politics, education, and other important aspects of society. Credit toward a degree will be given for only one of BIOL 2100 or PHIL 2100. *Preq:* BIOL 1040 or BIOL 1110; and one of BIOL 1220 or BIOL 1230; and General Education Natural Science requirement.
- BIOL 2110 Introduction to Toxicology 3 (3)** Acquaints students with the field of toxicology, integrates the science of toxicology with regulatory policy, and demonstrates its impact on our daily lives. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110.
- BIOL 2200 Biology: Concepts, Issues, and Values 3 (3)** Develops a thorough knowledge of basic biological concepts and issues and explores how these can be incorporated into a system of human values affecting technology, society, and life.
- BIOL 2220 Human Anatomy and Physiology I 4 (3)** Basic introductory course in integrated human anatomy and physiology covering cells and tissues; integumentary, skeletal, muscular, and nervous systems; sensory organs. Physiology is stressed. Structured for Nursing and other health-related curricula. *Preq:* BIOL 1030 and BIOL 1050; or BIOL 1100; and CH 1010 or CH 1050. *Coreq:* BIOL 2221.
- BIOL 2221 Human Anatomy and Physiology I Laboratory 0 (2)** Non-credit laboratory to accompany BIOL 2220. *Coreq:* BIOL 2220.
- BIOL 2230 Human Anatomy and Physiology II 4 (3)** Continuation of BIOL 2220 covering endocrine, reproductive, cardiovascular, lymphatic, respiratory, urinary, and digestive systems; fluid and electrolyte balance. Physiology is stressed. *Preq:* BIOL 2220. *Coreq:* BIOL 2231.
- BIOL 2231 Human Anatomy and Physiology II Laboratory 0 (2)** Non-credit laboratory to accompany BIOL 2230. *Coreq:* BIOL 2230.
- BIOL 2300 Emergency Medical Responder 3 (3)** Students are prepared to provide emergency pre-hospital assessment and care for patients with a variety of medical conditions and traumatic injuries. Study areas include introduction to emergency medical services systems, EMR roles and responsibilities, anatomy and physiology, medical emergencies, trauma, and working in the pre-hospital setting. *Preq:* BIOL 1030 and BIOL 1040, and BIOL 1050 and BIOL 1060; or BIOL 1100 and BIOL 1110.
- BIOL 3010 Insect Biology and Diversity 4 (3)** Introduction to the study of insects, with emphasis on their structure, function, ecology, and behavior. Identification of commonly encountered species is highlighted. Relationships between insect and human populations are discussed. Control technologies are introduced, with emphasis on environmentally responsible tactics. Offered fall semester only. *Coreq:* BIOL 3011.
- BIOL 3011 Insect Biology and Diversity Laboratory 0 (3)** Non-credit laboratory to accompany BIOL 3010. *Coreq:* BIOL 3010.
- BIOL 3020 Invertebrate Biology 3 (3)** In-depth survey and comparison of free-living invertebrate animals emphasizing functional anatomy, development, and evolutionary relationships. Includes Honors sections. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110. *Preq or concurrent enrollment:* BIOL 3060.
- BIOL 3030 Vertebrate Biology 3 (3)** Comprehensive survey of vertebrate animals, including their taxonomy, morphology, evolution, and selected aspects of the natural history and behavior. Includes Honors sections. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110.
- BIOL 3040 Biology of Plants 3 (3)** Survey of the major groups of plants, their biology, diversity, and evolution. Includes Honors sections. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110. *Preq or concurrent enrollment:* BIOL 3080.
- BIOL 3060 Invertebrate Biology Laboratory 1 (3)** Survey and comparison of the biology of living invertebrates, examples of which are drawn primarily from the southeastern coast of the United States. *Preq:* Introductory two-semester biology sequence with laboratory. *Preq or concurrent enrollment:* BIOL 3020.
- BIOL 3070 Vertebrate Biology Laboratory 1 (3)** Comparative and phylogenetic study of the gross morphology of vertebrates. *Preq or concurrent enrollment:* BIOL 3030.
- BIOL 3080 Biology of Plants Practicum 1 (3)** Laboratory exercises that explore the major groups of plants, their biology, diversity, and evolution. *Preq or concurrent enrollment:* BIOL 3040.
- BIOL (WFB) 3130 Conservation Biology 3 (3)** Study of the biological bases for the conservation of flora, fauna, and habitats. Biological factors that influence the decision-making process are also addressed. May also be offered as WFB 3130. *Preq:* BIOL 1030 and BIOL 1050 and BIOL 1040 and BIOL 1060; or BIOL 1100 and BIOL 1110.
- BIOL 3150 Functional Human Anatomy 4 (3)** Introduction to the anatomical structures associated with all organ systems found in the human body at both the gross and microscopic level. Basic physiology is integrated to assist with understanding the function of the anatomical systems. *Preq:* BIOL 1030 and BIOL 1050; or BIOL 1100; and junior standing. *Coreq:* BIOL 3151.
- BIOL 3151 Functional Human Anatomy Laboratory 0 (3)** Non-credit laboratory to accompany BIOL 3150. *Coreq:* BIOL 3150.
- BIOL 3160 Human Physiology 4 (3)** Study of the functional processes associated with the various organ systems in the human body. Students develop a basic understanding of the important and fundamental concepts in human physiology and how organ systems maintain homeostasis. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110; and CH 1020; and junior standing. *Coreq:* BIOL 3161.
- BIOL 3161 Human Physiology Laboratory 0 (3)** Non-credit laboratory to accompany BIOL 3160. *Coreq:* BIOL 3160.
- BIOL 3200 Field Botany 4 (2)** Introductory study of the taxonomy, ecology, and evolution of plants in their natural environment with an emphasis on identification and characteristics of representative species and plant communities in the Carolinas. Includes one or two required Saturday field trips. *Coreq:* BIOL 3201.
- BIOL 3201 Field Botany Laboratory 0 (4)** Non-credit laboratory to accompany BIOL 3200. *Coreq:* BIOL 3200.
- BIOL 3350 Evolutionary Biology 3 (3)** Introduction to basic concepts and underlying principles of modern evolutionary biology. Topics include a historical overview of evolutionary theories, elementary population genetics, principles of adaptation, speciation, systematics and phylogenetic inference, fossil record, biogeography, molecular evolution, and human evolution. *Preq:* GEN 3000 or GEN 3020.
- BIOL (PES) 3400 Medical Botany 3 (3)** Study of use of compounds of plant and fungal origin as poisons, hallucinogens, and pharmaceuticals. May also be offered as PES 3400. *Preq:* BIOL 1040 and BIOL 1060 and CH 1020.
- BIOL (ANTH) 3510 Biological Anthropology 3 (3)** Study of humans as biological organisms. Examines human evolution, primate social behavior, human physiological variations and disease resistance, and human skeletal anatomy and forensics. May also be offered as ANTH 3510. *Preq:* ANTH 2010 or BIOL 1100.

- BIOL (ANTH) 3530 Forensic Anthropology 3 (3)** Introduction to forensic anthropology, the science that utilizes methods from skeletal biology and archaeology as tools in human identification in a medico-legal context. May also be offered as ANTH 3530. *Preq:* Junior standing.
- BIOL 3940 Selected Topics in Creative Inquiry I 3 (1)** Disciplinary and multidisciplinary group research projects develop the student's ability to discover, analyze, and evaluate data. Students are required to document their research activities in their portfolios. May be repeated for a maximum of six credits. Honors students must take at least six credits over a two-semester period with the same research advisor and write an honors thesis. These credits may include BIOL 3940, BIOL 4940 or both. Includes Honors sections. *Preq:* Consent of instructor. *Coreq:* BIOL 3941.
- BIOL 3941 Selected Topics in Creative Inquiry I Laboratory 0 (6)** Non-credit laboratory to accompany BIOL 3940. *Coreq:* BIOL 3940.
- BIOL (ENT) 4000* Insect Morphology 4 (3)** Study of insect structure in relation to function and of the variation of form in insects. Includes Honors sections. May also be offered as ENT 4000. *Preq:* ENT 3010. *Coreq:* BIOL 4001.
- BIOL (ENT) 4001* Insect Morphology Laboratory 0 (3)** Non-credit laboratory to accompany BIOL 4000. May also be offered as ENT 4001. *Coreq:* BIOL 4000.
- BIOL 4010* Plant Physiology 3 (3)** Relations and processes pertaining to maintenance, growth, and reproduction of plants, including absorption of matter and energy, water relations of the plant, utilization of reserve products and liberation of energy. Includes Honors sections. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110; and CH 1020. *Preq or concurrent enrollment:* BIOL 4020.
- BIOL 4020* Plant Physiology Laboratory 1 (3)** Laboratory exercises and experiments designed to indicate the relations and processes which pertain to maintenance, growth, and reproduction of plants, including absorption of matter and energy, water relations of the plant, utilization of reserve products, and liberation of energy. *Preq or concurrent enrollment:* BIOL 4010.
- BIOL 4030* Introduction to Applied Genomics 3 (3)** Emphasizes the practical application of bioinformatic/genomic skills to solve biological problems. The course includes an introduction to the Linux operating system, the bash command line environment, principles of next-generation sequencing, genome assembly, gene prediction, annotation, databases, gene/genome clustering, recombination detection, phylogenomics, transcriptomics, and metagenomics. *Preq:* GEN 3000 or GEN 3020 or MICR 4150.
- BIOL (GEN) 4050* Molecular Genetics of Eukaryotes 3 (3)** Molecular genetic analyses of eukaryotes in relation to mutations and repair, complex phenotypes, biochemical pathways, short- and long-term regulation of gene expression, and evolution. May also be offered as GEN 4050. *Preq:* one of the following combinations: BCHM 3010 or BCHM 3050; or GEN 3000 and GEN 3020.
- BIOL 4060* Introductory Plant Taxonomy 3 (3)** Introduction to the basic principles and concepts of plant systematics with emphasis on the plants of South Carolina. Includes Honors sections. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110. *Coreq:* BIOL 4070.
- BIOL 4070* Plant Taxonomy Laboratory 1 (3)** Introduction to basic techniques of plant taxonomy with laboratory and field emphasis on the flora of South Carolina. *Coreq:* BIOL 4060.
- BIOL 4080* Comparative Vertebrate Morphology 3 (3)** Phylogeny and diversity of vertebrates and study of their comparative morphology, leading to an understanding of the relationships and functioning of living organisms. Includes Honors sections. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110. *Coreq:* BIOL 4090.
- BIOL 4090* Comparative Vertebrate Morphology Laboratory 2 (5)** Comparative anatomy of representative vertebrates; methods used in preparing specimens for study and display. Includes Honors sections. *Coreq:* BIOL 4080.
- BIOL 4100* Limnology 3 (3)** Detailed introduction to the physical, chemical, and biological interrelationships that characterize inland water environments. A fundamental approach to the interactions of components of the environment is developed at a theoretical level. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110.
- BIOL 4110* Limnological Analyses 2 (1)** Examines a broad range of topics covered with both standing and running fresh waters. About one-third of the laboratory exercises address the major physical components of lakes and streams. The remainder provides rationale and methods for quantitative analyses of biota, as well as some integrated analyses of whole ecosystems. Includes Honors sections. *Preq or concurrent enrollment:* BIOL 4100 or BIOL 4430. *Coreq:* BIOL 4111.
- BIOL 4111* Limnological Analyses Laboratory 0 (2)** Non-credit laboratory to accompany BIOL 4110. *Coreq:* BIOL 4110.
- BIOL (ENR) 4130* Restoration Ecology 3 (3)** Applies ecological principles to the restoration of disturbed terrestrial, wetland, and aquatic ecosystems. Includes the restoration of soils and waterways, of flora and fauna, and of natural ecological processes such as plant succession and nutrient cycling. May also be offered as ENR 4130. *Preq:* BIOL (WFB) 3130 or BIOL 4410.
- BIOL (AVS, MICR) 4140* Basic Immunology 3 (3)** Introduction to the immune system of vertebrate animals, with an emphasis on structure, function, regulation, and cellular and molecular mechanisms of immune responses. Includes Honors sections. May also be offered as AVS 4140 or MICR 4140. *Preq:* BIOL 4610 and MICR 3050.
- BIOL (ENT) 4150* Insect Taxonomy 3 (1)** Identification of the principal families of the major orders of adult insects. Laboratory work consists of intensive practice of such identification. Lecture material deals with theoretical discussion of taxonomic features observed in the laboratory. May also be offered as ENT 4150. *Preq:* BIOL 4000 or ENT 4000. *Coreq:* BIOL 4151.
- BIOL (ENT) 4151* Insect Taxonomy Laboratory 0 (6)** Non-credit laboratory to accompany BIOL 4150. May also be offered as ENT 4151. *Coreq:* BIOL 4150.
- BIOL 4170* Marine Biology 3 (3)** Survey of the organisms that live in the sea and their adaptations to the marine environment. Emphasizes characteristics of marine habitats, organisms, and the ecosystems. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110.
- BIOL 4200* Neurobiology 3 (3)** Broad background in neurobiology. Topics include neuroanatomical structure-function; conduction in the neuron; neurite growth and development; neuromuscular junction; chemistry, physiology, and pharmacology of specific neurotransmitters and receptors; visual process; axoplasmic transport; hypothalamic-pituitary regulation; theories of behavior; theories of learning and memory. Includes Honors sections. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110.
- BIOL (AVS, MICR) 4240 Immunology Laboratory 1 (3)** This course is designed to apply the knowledge gained in MICR 4140, Immunology lecture, in an applied setting. The experiments in this beginning immunology laboratory are designed to study both the innate and acquired immune systems. Experimentation into the formation, function and detection of antibodies provides students with skills in basic immunologic techniques. May also be offered as AVS 4240 or MICR 4240. *Preq or concurrent enrollment:* MICR 4140.
- BIOL (PLPA) 4250* Introductory Mycology 3 (3)** Introduction to the biology of all the groups of fungi and some related organisms, with considerations of the taxonomy, morphology, development, physiology, and ecology of representative forms. May also be offered as PLPA 4250. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110. *Preq or concurrent enrollment:* BIOL 4260 or PLPA 4260.
- BIOL (PLPA) 4260* Mycology Practicum 2 (1)** Application of the principles of mycological techniques, microscopic study of fungi. Examples from all major groups of fungi are included. May also be offered as PLPA 4260. *Preq or concurrent enrollment:* BIOL 4250 or PLPA 4250. *Coreq:* BIOL 4261.
- BIOL (PLPA) 4261* Mycology Practicum Laboratory 0 (2)** Non-credit laboratory to accompany BIOL 4260. May also be offered as PLPA 4261. *Coreq:* BIOL 4260.
- BIOL 4280* Quantitative Biology 4 (3)** Applies quantitative methods to a wide range of biological problems. Main focus is on building modeling skills using population, physiological, genetic, and evolutionary problems. Also includes a review of statistical principles and introduces basic bioinformatics techniques. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110; and MATH 1080 or MATH 1110. *Coreq:* BIOL 4281.
- BIOL 4281* Quantitative Biology Laboratory 0 (3)** Non-credit laboratory to accompany BIOL 4280. *Coreq:* BIOL 4280.
- BIOL 4320* Animal Histology 3 (3)** Structural and functional study of the basic tissues of animals and tissue makeup of organs. Emphasizes light microscopy level with selected tissue studied at the electron microscope level. Includes Honors sections. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110. *Coreq:* BIOL 4330.

- BIOL 4330* Animal Histology Laboratory 2 (1)** Microscopic examination of basic animal tissue types and the tissue makeup of organs which comprise systems. Includes Honors sections. *Coreq:* BIOL 4320 and BIOL 4331.
- BIOL 4331* Animal Histology Laboratory 0 (2)** Non-credit laboratory to accompany BIOL 4330. *Coreq:* BIOL 4330.
- BIOL 4340 Biological Chemistry Laboratory Techniques 2 (1)** Theory and application of some of the routine tools and techniques used in biological chemistry. Lectures introduce laboratory theory and provide additional laboratory instructions; discuss results; and conduct student evaluations. Laboratory periods are used to conduct each activity. *Preq or concurrent enrollment:* BCHM 3010 or BCHM 3050. *Coreq:* BIOL 4341.
- BIOL 4341 Biological Chemistry Laboratory Techniques Laboratory 0 (3)** Non-credit laboratory to accompany BIOL 4340. *Coreq:* BIOL 4340.
- BIOL (ENT) 4360* Insect Behavior 3 (2)** Fundamentals of insect behavior in an evolutionary and ecological perspective. Laboratory emphasizes generation and testing of hypotheses and observation, description, and quantification of insect behavior. May also be offered as ENT 4360. *Preq:* ENT 3010. *Coreq:* BIOL 4361.
- BIOL (ENT) 4361* Insect Behavior Laboratory 0 (3)** Non-credit laboratory to accompany BIOL 4360. May also be offered as ENT 4361. *Coreq:* BIOL 4360.
- BIOL 4400* Developmental Animal Biology 3 (3)** Events and mechanisms responsible for the development of multicellular animals. Gametogenesis, fertilization, embryonic development, cellular differentiation, morphogenesis, larval forms and metamorphosis, asexual reproduction, regeneration, malignancy, and aging are analyzed in terms of fundamental concepts and control processes. Includes Honors sections. *Preq:* BCHM 3010 or 3050.
- BIOL 4410* Ecology 3 (3)** Study of basic ecological principles underlying the relationships between organisms and their biotic and abiotic environments. Includes physiological, population, and community ecology, with applications of each to human ecological concerns. Includes Honors sections. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110.
- BIOL 4420* Biogeography 3 (3)** Study of patterns of distribution of plants and animals in space and time. Includes Honors sections. *Preq:* BIOL 3020 or BIOL 3030 or BIOL 3040.
- BIOL 4430* Freshwater Ecology 3 (3)** Study of basic ecological principles and concepts as they apply to freshwater environments: rivers and streams, wetlands, lakes and ponds, and reservoirs. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110.
- BIOL 4440* Freshwater Ecology Laboratory (Lecture Portion) 2 (1)** Laboratory-based course providing a synthesis of major components of freshwater ecosystems. Activities are hypothesis driven and relate to each other to form an overall synthesis of the field. Hands-on experience allows engagement in creative inquiry. *Preq or concurrent enrollment:* BIOL 4430. *Coreq:* BIOL 4441.
- BIOL 4441* Freshwater Ecology Laboratory 0 (2)** Non-credit laboratory to accompany BIOL 4440. *Coreq:* BIOL 4440.
- BIOL 4450* Ecology Laboratory (Lecture Portion) 2 (1)** Modern and classical approaches to the study of ecological problems discussed in BIOL 4410. Students are introduced to field, laboratory and computer-based analyses of plant and animal populations and communities. Includes Honors sections. *Preq or concurrent enrollment:* BIOL 4410. *Coreq:* BIOL 4451.
- BIOL 4451 Ecology Laboratory 0 (2)** Non-credit laboratory to accompany BIOL 4450. *Coreq:* BIOL 4450.
- BIOL 4460* Plant Ecology 3 (3)** Ecology of plants in relation to their biotic and abiotic environments. Individual organisms, populations, and communities are considered with an emphasis on seed plants in terrestrial environments. Includes Honors sections. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110.
- BIOL 4470* Plant Ecology Laboratory (Lecture Portion) 2 (1)** Experimental and observational approach to addressing principles discussed in BIOL 4460. Students are introduced to field and laboratory methods involving individual organisms, populations, and communities. Includes Honors sections. *Preq or concurrent enrollment:* BIOL 4460. *Coreq:* BIOL 4471.
- BIOL 4471* Plant Ecology Laboratory 0 (2)** Non-credit laboratory to accompany BIOL 4470. *Coreq:* BIOL 4470.
- BIOL 4500* Developmental Biology Laboratory (Lecture Portion) 2 (1)** Examines a broad range of topics concerned with the development of multicellular animals such as gametogenesis, fertilization, embryonic development, cell differentiation, morphogenesis, larval metamorphosis, and regeneration. Laboratory exercises provide the rationale and methods for the descriptive and experimental analysis of development in representative invertebrates and vertebrates. Includes Honors sections. *Preq or concurrent enrollment:* BIOL 4400. *Coreq:* BIOL 4501.
- BIOL 4501* Developmental Biology Laboratory 0 (2)** Non-credit laboratory to accompany BIOL 4500. *Coreq:* BIOL 4500.
- BIOL (ANTH) 4510 Biological Variation in Human Populations 3 (3)** Provides an in-depth discussion of the most influential topics in human skeletal biology. Course explores the history and ethical dilemmas of the field, and examines how biological anthropologists use skeletons to reconstruct patterns of diet, disease, demography and physical activity in human populations. May be offered as ANTH 4510. *Preq:* ANTH 2010.
- BIOL (PLPA) 4540* Plant Virology 4 (3)** Study of plant viruses: their morphology, biochemistry, purification, and transmission; symptoms resulting from virus infection; virus vector relationships. Serological and nucleic acid hybridization procedures. Diagnosis of viral diseases and the identification of causal agents. Replication of plant viruses, the interaction between viral host and plant genome. Control of plant viral diseases. May also be offered as PLPA 4540. *Preq:* BCHM 3010 or BCHM 3050 or MICR 3050. *Coreq:* BIOL 4541.
- BIOL (PLPA) 4541* Plant Virology Laboratory 0 (3)** Non-credit laboratory to accompany BIOL 4540. May also be offered as PLPA 4541. *Coreq:* BIOL 4540.
- BIOL (MICR) 4560* Medical and Veterinary Parasitology 3 (3)** Introduction to parasitism in the animal kingdom. Emphasizes basic and applied principles related to economically and medically important diseases. Classical and experimental approaches to the study of parasitism are examined in reference to protozoa, helminths, and arthropods. Includes Honors sections. May also be offered as MICR 4560. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110. *Coreq:* BIOL 4570.
- BIOL (MICR) 4570* Medical and Veterinary Parasitology Laboratory (Lecture Portion) 2 (1)** Laboratory to reinforce material presented in BIOL 4560. Introduces students to both live and preserved human/animal parasites. Also introduces techniques used in collection, preservation, and examination of animal parasites. Includes Honors sections. May also be offered as MICR 4570. *Coreq:* BIOL 4560 and BIOL 4571.
- BIOL 4571* Medical and Veterinary Parasitology Laboratory 0 (2)** Non-credit laboratory to accompany BIOL 4570. *Coreq:* BIOL 4570.
- BIOL 4580* Cell Physiology 3 (3)** Study of the chemical and physical principles of cell function emphasizing bioenergetics and membrane phenomena. Includes Honors sections. *Preq:* BCHM 3010 or BCHM 3050.
- BIOL 4590* Systems Physiology 3 (3)** Physiological systems of vertebrates and their homeostatic controls. Describes the function of the major physiological systems in terms of anatomical structure and chemical and physical principles. Includes Honors sections. *Preq:* [BIOL 1040 and BIOL 1060; or BIOL 1110]; and [CH 1020; or PHYS 2080 and PHYS 2100; or PHYS 2210 and PHYS 2230.]
- BIOL 4600* Systems Physiology Laboratory (Lecture Portion) 2 (1)** Modern and classical experimental methods are used to demonstrate fundamental physiological principles discussed in BIOL 4590. Students are introduced to computer-aided data acquisition and computer simulations of physiological function. *Preq or concurrent enrollment:* BIOL 4590. *Coreq:* BIOL 4601.
- BIOL 4601* Systems Physiology Laboratory 0 (2)** Non-credit laboratory to accompany BIOL 4600. *Coreq:* BIOL 4600.
- BIOL 4610* Cell Biology 3 (3)** In-depth analysis of how and where intracellular and extracellular molecules control general and specific cellular functions such as gene expression, secretion, motility, signaling, cell-cycle control and differentiation. Taught and graded at a level where students are expected to infer from and integrate cellular events. Includes Honors sections. *Preq:* BCHM 3010 or BCHM 3050.
- BIOL 4620* Cell Biology Laboratory (Lecture Portion) 2 (1)** Laboratory to accompany BIOL 4610. Focuses on molecular and microscopic analysis of eukaryotic cells. *Preq or concurrent enrollment:* BIOL 4610. *Coreq:* BIOL 4621.
- BIOL 4621* Cell Biology Laboratory 0 (2)** Non-credit laboratory to accompany BIOL 4620. *Coreq:* BIOL 4620.
- BIOL 4640* Mammalogy 4 (3)** Origin, evolution, distribution, structure, and function of mammals, with laboratory emphasis on the mammals of the Southeast. *Preq:* BIOL 3030. *Coreq:* BIOL 4641.

- BIOL 4641* Mammalogy Laboratory 0 (3)** Non-credit laboratory to accompany BIOL 4640. *Coreq:* BIOL 4640.
- BIOL (ANTH) 4660* Evolution of Human Behavior 3 (3)** Familiarizes students with the evolutionary basis of human behavior. Examines topics such as altruism, cooperation, mating systems, parental investment, and social systems using diverse examples, from hunter-gatherer to technological societies. May also be offered as ANTH 4660. *Preq:* ANTH 3510 or BIOL 3350 or BIOL 4700 or PSYC 2010.
- BIOL 4670 Principles of Hematology 3 (3)** Basic hematological principles as they relate to normal blood cell production, as well as in abnormal conditions that result in diseases of the hematological system. Clinical practice, ethics and controversies in hematology are discussed. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110.
- BIOL (WFB) 4680* Herpetology 4 (3)** Physiology, functional morphology, ecology, evolution, biomechanics and current literature of amphibians and reptiles. Laboratory study examines morphology and identification of world families and United States genera, as well as southeastern species. Field trips are required. May also be offered as WFB 4680. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110. *Coreq:* BIOL 4681.
- BIOL (WFB) 4681* Herpetology Laboratory 0 (3)** Non-credit laboratory to accompany BIOL 4680. May also be offered as WFB 4681. *Coreq:* BIOL 4680.
- BIOL (ENT, WFB) 4690* Aquatic Insects 3 (1)** Identification, life history, habitats, and interrelationships of aquatic insects; techniques of qualitative field collecting; important literature and research workers. Includes Honors sections. May also be offered as ENT 4690 or WFB 4690. *Preq:* ENT 3010. *Coreq:* BIOL 4691.
- BIOL (ENT, WFB) 4691* Aquatic Insects Laboratory 0 (6)** Non-credit laboratory to accompany BIOL 4690. May also be offered as ENT 4691 or WFB 4691. *Coreq:* BIOL 4690.
- BIOL 4700* Behavioral Ecology 3 (3)** Historical and modern developments in animal behavior emphasizing the evolutionary and ecological determinants of behavior. A synthesis of ethology and comparative psychology. Includes Honors sections. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110.
- BIOL 4710* Behavioral Ecology Laboratory (Lecture Portion) 2 (1)** Laboratory exercises that explore the behavior of animals. Emphasizes behavioral observation and analysis and presentation of findings in a report format. Includes a semester-long independent research project. *Preq or concurrent enrollment:* BIOL 4700. *Coreq:* BIOL 4711.
- BIOL 4711* Behavioral Ecology Laboratory 0 (2)** Non-credit laboratory to accompany BIOL 4710. *Coreq:* BIOL 4710.
- BIOL 4720* Ornithology 4 (3)** Biology of birds: their origin and diversification, adaptations, phylogeny, classification, structure and function, behavior, ecology, and biogeography. Field identification is emphasized, and field trips are required. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110. *Coreq:* BIOL 4721.
- BIOL 4721* Ornithology Laboratory 0 (3)** Non-credit laboratory to accompany BIOL 4720. *Coreq:* BIOL 4720.
- BIOL 4730* History of Modern Biology 3 (3)** Examines the intellectual and social factors defining the study of life from the scientific revolution of the 1600's to the modern biological sciences. Investigates the historical origins of biological disciplines and explores the differing cultures, methodologies, and philosophical commitments of these communities. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110.
- BIOL (ANTH) 4740* Primatology 4 (3)** Biology of nonhuman primates, including their evolution, taxonomy, physiology, life history, behavioral ecology and conservation. Three field trips are required, during which students conduct behavioral observations and later analyze their data and present it in report format. May also be offered as ANTH 4740. *Preq:* ANTH 3510; and either BIOL 1110 or both BIOL 1040 and BIOL 1060. *Coreq:* BIOL 4741.
- BIOL (ANTH) 4741* Primatology Laboratory 0 (3)** Non-credit laboratory to accompany BIOL 4740. May also be offered as ANTH 4741. *Coreq:* BIOL 4740.
- BIOL 4750* Comparative Physiology 3 (3)** Physiological systems of invertebrates and vertebrates emphasizing environmental adaptation. Physiological principles as they relate to metabolism, thermoregulation, osmoregulation, respiration, and neural and integrative physiology. Includes Honors sections. *Preq:* CH 1020; and either BIOL 1110 or both BIOL 1040 and BIOL 1060.
- BIOL 4760* Comparative Physiology Laboratory (Lecture Portion) 2 (1)** Modern classical experimental methods are used to demonstrate fundamental physiological principles discussed in BIOL 4750. Introduces students to computer-aided data acquisition and manipulation as well as computer simulations of physiological function. Includes Honors sections. *Preq or concurrent enrollment:* BIOL 4750. *Coreq:* BIOL 4761.
- BIOL 4761* Comparative Physiology Laboratory 0 (2)** Non-credit laboratory to accompany BIOL 4760. *Coreq:* BIOL 4760.
- BIOL 4770* Ichthyology 3 (2)** Systematics, life history, distribution, ecology, and current literature of fish. Laboratory study of morphology and identification of U.S. genera, as well as all southeastern species. Field trips are required. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110. *Coreq:* BIOL 4771.
- BIOL 4771* Ichthyology Laboratory 0 (3)** Non-credit laboratory to accompany BIOL 4770. *Coreq:* BIOL 4770.
- BIOL 4780 Exercise Physiology 3 (3)** Introduction to the physiology of exercise. Focuses on the function and adaptations of body systems in response to exercise. Structured primarily for students interested in Prerehabilitation Sciences. *Preq:* BIOL 2220 and BIOL 2230; or BIOL 3150 and BIOL 3160.
- BIOL 4790 Kinesiology 3 (3)** Introduction to the study of human movement. Focuses on the application of biomechanical and motor control principles to human motion, including daily living, sport, and work activities. Structured primarily for students interested in Prerehabilitation Sciences. *Preq:* BIOL 2220 or BIOL 3150.
- BIOL (AVS) 4800* Vertebrate Endocrinology 3 (3)** Introduction to the basic principles of neuro-endocrine integration and homeostatic maintenance in vertebrates. Comparative morphology and physiology of various endocrine tissues and hormone chemistry and modes of action are considered. May also be offered as AVS 4800. *Preq:* BCHM 3010 or BCHM 3050.
- BIOL (EDSC) 4820* Laboratory Techniques for Teaching Science 3 (1)** Focuses on basic lab skills needed to plan, prepare, and conduct inquiry-based laboratories and to familiarize pre-service teachers with a variety of scientific equipment and their methodologies. Topics include ways to integrate technology into the classroom, lab safety, and the development of inquiry-based classroom activities. May also be offered as EDSC 4820. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110. *Coreq:* BIOL 4821.
- BIOL (EDSC) 4821* Laboratory Techniques for Teaching Science 0 (6)** Non-credit laboratory to accompany BIOL 4820. May also be offered as EDSC 4821. *Coreq:* BIOL 4820.
- BIOL 4830* Stem Cell Biology 3 (3)** Stem cells are the focus of intense interest because of their utility for treating human diseases. This course provides a broad treatment of the biology of stem cells and assesses their current therapeutic capacity in clinical medicine. *Preq:* BIOL 4610.
- BIOL 4840* Human and Comparative Vertebrate Embryology 3 (3)** Study of human and comparative embryology with an introduction to related clinical correlations. Students develop an understanding of normal and abnormal human and comparative vertebrate embryonic development. Includes Honors sections. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110.
- BIOL 4860 Natural History 3 (3)** Interdisciplinary examination, through readings and critical discussion, of concepts of nature and biodiversity in relation to human endeavors. Course seeks to achieve a balanced perspective from which to seek compromises between conflicting views of nature. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110.
- BIOL 4870* Electron and Optical Microscopy Theory 3 (2)** Offers a theoretical and practical introduction to light and electron microscopy. Topics include Koehler illumination, polarization, interference, phase contrast, DIC epifluorescence, laser scanning light microscopy, SEM, TEM, EDS, ultramicrotomy, tomography, and digital imaging. *Preq:* Consent of instructor. *Coreq:* BIOL 4871.
- BIOL 4871* Electron and Optical Microscopy Laboratory 0 (2)** Non-credit laboratory to accompany BIOL 4870. *Coreq:* BIOL 4870.
- BIOL 4890 Clinical Applications and Medical Practice 3 (2)** Explores the various fields, specialties, and subspecialties in medicine. Provides students with the opportunity to shadow physicians in a hospital and/or office setting and to discuss current issues and advances in medicine with practicing physicians and other health care professionals. *Preq:* Consent of instructor. *Coreq:* BIOL 4891.
- BIOL 4891 Clinical Applications and Medical Practices Laboratory 0 (2)** Non-credit laboratory to accompany BIOL 4890. *Coreq:* BIOL 4890.

BIOL 4910 Undergraduate Research in Biological Sciences 1-4 (1-6) Mentored research problems introduce undergraduate students to the planning and execution of research and the presentation of research findings. May be repeated for a maximum of eight credits. Honors students must take at least six credits under a single research advisor over two semesters and must write an honors thesis. Includes Honors sections. *Prq:* Consent of instructor.

BIOL 4920 Internship in Biological Sciences 0-4 (3-12) Preplanned internship at an advisor-approved facility to give students learning opportunities beyond their classroom experiences. Students submit a Student Internship Contract and a study plan before the internship and a comprehensive report within one week of the end of the internship. May be repeated for a maximum of six credits. To be taken Pass/Fail only. *Prq:* Consent of instructor.

BIOL 4930 Senior Seminar 2 (2) Capstone course engaging students in analysis and discussion of publications from the technical and non-technical literature in biological sciences and from current topics of biology appearing in other media. Students complete their undergraduate on-line digital portfolios. Emphasis is placed on ethical issues that arise as a result of biological research. *Prq:* Senior standing; COMM 1500 or COMM 2500 or ENGL 3140 or ENGL 3150.

BIOL (MICR) 4940 Selected Topics in Creative Inquiry II 2-3 (1) Disciplinary and multidisciplinary group research projects with the goal of developing the students' ability to discover, analyze, and evaluate data. Students are required to document their research activities in their portfolios. May be repeated for a maximum of six credits. Honors students must take at least six credits over a two-semester period with the same research advisor and write an honors thesis. These credits may include BIOL 3940, BIOL 4940 or both. Includes Honors sections. May also be offered as MICR 4940. *Prq:* Consent of instructor. *Coreq:* BIOL 4941.

BIOL (MICR) 4941 Selected Topics in Creative Inquiry II Laboratory 0 (3-6) Non-credit laboratory to accompany BIOL 4940. May also be offered as MICR 4941. *Coreq:* BIOL 4940.

BIOL 4950 Service Learning in Biology 2-4 (1-2) Combines service and academic learning while helping pre-college or college students learn about the fundamental aspects of science. Provides lecture and laboratory experiences as students learn to prepare and participate in supervised laboratory teaching for pre-college or college students. May be repeated for a maximum of six credits. *Prq:* Consent of instructor. *Coreq:* BIOL 4951.

BIOL 4951 Service Learning in Biology Laboratory 0 (3-9) Non-credit laboratory to accompany BIOL 4950. *Coreq:* BIOL 4950.

BIOL 4960 Selected Topics 1-4 (1-4) Lecture coverage of selected topics in cellular and developmental biology, ecology, behavior, evolutionary biology, molecular biology, physiology, systematics, and other topics in the biological sciences. May be repeated for a maximum of nine credits, but only if different topics are covered. *Prq:* Consent of instructor.

BIOL 4970 Special Topics Laboratory 1-3 (2-9) Specialized laboratory experiences in cellular and developmental biology, ecology, behavior, evolutionary biology, molecular biology, physiology, systematics, and other topics of interest in the biological sciences. May be repeated for a maximum of nine credits, but only if different topics are covered. *Prq:* Consent of instructor.

BIOMOLECULAR ENGINEERING

BMOL 4030* Biotransport Phenomena 3 (3) Analysis of single and multidimensional steady-state and transient problems in momentum, mass, and energy transfer in biological systems. Mathematical similarities and differences in these mechanisms are stressed, and mathematical descriptions of physiological and engineering systems are formulated. *Prq:* CHE 3300 and MATH 2080.

BMOL 4230* Bioseparations 3 (3) Study of principal methods of separation and purification of bioproducts, such as proteins, amino acids, and pharmaceuticals. Topics include analytical bioseparations, membrane separations, sedimentation, cell disruption, extraction, adsorption, chromatography, precipitation, crystallization, and drying. *Prq:* CHE 3300; and BCHM 3010 or BCHM 3050 or BCHM 4230.

BMOL 4250* Biomolecular Engineering 3 (3) Introduction to basic principles of biomolecular engineering: the purposeful manipulation of biological molecules and processes applied to problems and issues in the life sciences, biotechnology, and medicine. Topics include carbohydrates, proteins, nucleic acids, and lipids with emphasis on their structure-property-function relations; molecular recognition; biochemical pathway engineering; and cell growth. *Prq:* CHE 2300 and CHE 3190.

BMOL 4260* Biosensors and Bioelectronic Devices 3 (3) Development of methodologies used to design, fabricate, and apply biosensors and bioelectronic devices for the environmental, medical, and chemicals industries. Application of the fundamentals of measurement science to optical, electrochemical, mass, and thermal means of signal transduction. Use of the fundamentals of surface science to interpret bio-immobilization and biomolecule-surface interactions. *Prq:* CHE 3300; and BCHM 3010 or BCHM 3050.

BMOL 4270* Membranes for Biotechnology and Biomedicine 3 (3) Students learn principles of membrane science and technology and study membrane applications in the biotechnology and biomedical industries. Advanced topics include surface modification of membranes, synthesis of porous membranes for biomedical applications such as tissue engineering, environmentally responsive membranes, and membrane-based biomedical devices. *Prq:* CHE 3300.

BIOSYSTEMS TECHNOLOGY

Professor: T.R. Dobbins; *Associate Professor:* C.M. Drapcho

BT 2200 Biosystems Technology I 3 (2) Introduces fundamental and applied concepts used in bioprocessing for biofuels and other high value compounds. Topics include operation of batch and continuous flow bioreactors, microbial growth in anaerobic and aerobic environments, fermentation for biofuel production, and use of renewable energy in bioprocessing. Laboratory includes hands-on exercises, problem-solving/computer sessions and oral presentations. *Prq:* BIOL 1030 and BIOL 1050 and CH 1010. *Coreq:* BT 2201.

BT 2201 Biosystems Technology I Laboratory 0 (3) Non-credit laboratory to accompany BT 2200. *Coreq:* BT 2200.

BT 2400 Biosystems Technology II 3 (2) Introduces basic unit operations used in bioprocessing for biofuels and other bioproducts. Covers operation and selection of pumps, heat exchangers, separation systems and sensors used in bioprocessing. Laboratory includes hands-on exercises, problem-solving/computer sessions, and oral presentations. *Prq:* BT 2200. *Coreq:* BT 2401.

BT 2401 Biosystems Technology II Laboratory 0 (3) Non-credit laboratory to accompany BT 2400. *Coreq:* BT 2400.

BUSINESS

Professor: M.A. McKnew; *Senior Lecturers:* E.B. De Iulio, S. Edge, J.G. Gaubert; *Lecturers:* R.A. Lucas, W.E. Tumblin

BUS 1010 Business Foundations 1 (1) Introduction to a variety of topics critical to student success, including an overview of Clemson business degrees, on-campus resources available to ensure success, academic advising, business ethics, internships, co-ops, study abroad programs, student organizations, ePortfolios, and Clemson history.

BUS 2910 Honors Seminar in International Business 1 (1) Introduction to the International Business Honors Program presented through a discussion of thesis expectations, study abroad experiences, and seminars given by returning senior International Business Honors students. To be taken Pass/No Pass only. *Prq:* Membership in Calhoun Honors College.

BUS 2990 Creative Inquiry—Business 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of four credits.

BUS 3910 International Business Honors Thesis Research 1 (1) Students work with a Clemson advisor and an international advisor to develop a research topic for the senior thesis. Students work and conduct research while participating in an approved study abroad. To be taken Pass/No Pass only. *Prq:* BUS 2910.

BUS 3920 International Business Honors Thesis Proposal 1 (1) Students work with a Clemson advisor and an international advisor to complete a proposal for the senior thesis. Students work and conduct research while participating in an approved study abroad. To be taken Pass/No Pass only. *Preq:* BUS 3910.

BUS 3990 Creative Inquiry—Business 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of four credits.

BUS 4910 International Business Honors Thesis I 3 (3) Students work with an advisor to conduct literature review and research on a senior thesis topic and prepare presentations and thesis drafts based on this work. *Preq:* BUS 3920.

BUS 4920 International Business Honors Thesis II 3 (3) Students work with an advisor to complete a senior thesis. They prepare and present a seminar on the topic for presentation to faculty and other International Business Honors students. *Preq:* BUS 4910.

BUS 4990 Creative Inquiry—Business 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of four credits.

COLLEGE OF ARCHITECTURE, ARTS AND HUMANITIES

CAAH 2010 Cultural Literacies Across Media 3 (3) Hands-on practicum course in which students reflect critically on the cultural, aural, visual, professional and technological literacies learned as a result of a semester-long study abroad experience. May be repeated for a maximum of six credits. *Preq:* Enrollment in a study abroad program and ENGL 1030.

CIVIL ENGINEERING

Professors: R.D. Andrus, *Associate Chair;* N.M. Aziz, J.L. Burati, M.A. Chowdhury, C.H. Juang, J.R. Martin, *Chair;* S.D. Schiff; *Associate Professors:* H.S. Atamturktur, N.B. Kaye, A.A. Khan, L.E. Klotz, J.H. Ogle, W. Pang, B.J. Putman, P.R. Rangaraju, N. Ravichandran, W.A. Sarasua, F.Y. Testik; *Assistant Professors:* Q. Chen, Y. Huang, A. Mishra, K.R. Piratla, A. Poursaee, B. Ross; *Senior Lecturers:* S.F. Csernak, B.G. Nielson, M.M. Sternhagen

CE 1990 Creative Inquiry—Civil Engineering 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of four credits. *Preq:* Consent of faculty member/mentor.

CE 2010 Statics 3 (3) Forces and force systems and their external effect on bodies, principally the condition of equilibrium. The techniques of vector mathematics are employed, and the rigor of physical analysis is emphasized. Includes Honors sections. *Preq:* PHYS 1220 with a C or better. *Preq or concurrent enrollment:* ENGR 1070 and MATH 2060.

CE 2060 Structural Mechanics 4 (3) Builds on statics to develop relationships between external loads on structural elements of civil engineering interest and the resulting internal loads and deformations. Students are exposed to the development of stress and deformation formulas and the identification and use of significant mechanical properties of civil engineering materials. *Preq:* CE 2010 and ENGR 1090 and MATH 2060. *Coreq:* CE 2061.

CE 2061 Structural Mechanics Laboratory 0 (3) Non-credit laboratory to accompany CE 2060. *Coreq:* CE 2060.

CE 2080 Dynamics 2 (2) Study of kinetics and kinematics of particles and rigid bodies, work and energy, impact and momentum. *Preq:* CE 2010 and ENGR 1090, each with a C or better, and MATH 2060.

CE 2550 Geomatics 3 (2) Spatial data collection methods, including surveying, digital photogrammetry and remote sensing, and global positioning systems. Methods and technologies used to manage, manipulate, and analyze spatial and associated attribute data, including geographic information systems. *Preq or concurrent enrollment:* ENGR 2100. *Coreq:* CE 2551.

CE 2551 Geomatics Laboratory 0 (3) Non-credit laboratory to accompany CE 2550. *Coreq:* CE 2550.

CE 2990 Creative Inquiry—Civil Engineering 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of four credits. *Preq:* Consent of faculty member/mentor.

CE 3010 Structural Analysis 3 (3) Calculation of design loads and load paths for buildings and other structures. Use of classical analysis techniques to determine support reactions, internal member forces, and structural displacements of statically determinate and indeterminate structural systems. *Preq:* CE 2060.

CE 3110 Transportation Engineering Planning and Design 3 (3) Covers planning, design, and operation of transportation facilities, including highways and airports. Includes economic, safety, and environmental considerations. Public transit systems are covered. *Preq:* CE 2550. *Preq or concurrent enrollment:* MATH 3020.

CE 3210 Geotechnical Engineering 4 (3) Mechanical and physical properties of soils and their relation to soil action in problems of engineering, such as classification, permeability, shearing strength, and consolidation: design of embankments and retaining walls with geotextiles. *Preq:* CE 2060 and GEOL 1010 and GEOL 1030. *Coreq:* CE 3211.

CE 3211 Geotechnical Engineering Laboratory 0 (3) Non-credit laboratory to accompany CE 3210. *Coreq:* CE 3210.

CE 3310 Construction Engineering and Management 3 (3) Considers construction contracts, technical specifications, cost estimating, project scheduling, cost control, materials management, quality control, and quality assurance. *Preq:* Junior standing.

CE 3410 Introduction to Fluid Mechanics 4 (3) Introduction to fluid mechanics, including hydrostatics and fluid flow. Includes principles of mass, momentum, and energy conservation. Other topics include conduit flow, pump systems, and open channel flow. Laboratory experiments familiarize students with laboratory techniques and instrumentation. The Effective Technical Communications Laboratory is used to prepare a presentation for a lab assignment. *Preq:* CE 2080 with a C or better or EM 2020 with a C or better. *Coreq:* CE 3411.

CE 3411 Introduction to Fluid Mechanics Laboratory 0 (3) Non-credit laboratory to accompany CE 3410. *Coreq:* CE 3410.

CE 3420 Applied Hydraulics and Hydrology 3 (3) Study of hydrologic cycle, including precipitation, evapotranspiration, infiltration, and runoff. Includes hydrograph analysis, gradually varied flow in open channel flow, design of stable channels, flood routing, groundwater hydraulics, flood frequency analysis, and hydrologic design. *Preq:* CE 3410.

CE 3510 Civil Engineering Materials 4 (3) Introduces students to material science and basic properties of construction materials such as aggregate, Portland cement, asphalt cement, concrete, steel, ceramics, wood, and fibers. Experiments in lab and field trips to nearby plants are required. Oral and written communication skills are an integral part of this course. *Preq:* ENGR 1090 and GEOL 1010 and GEOL 1030. *Preq or concurrent enrollment:* CE 2060 and MATH 3020. *Coreq:* CE 3511.

CE 3511 Civil Engineering Materials Laboratory 0 (3) Non-credit laboratory to accompany CE 3510. *Coreq:* CE 3510.

CE 3520 Economic Evaluation of Projects 2 (2) Comparison of design alternatives based on engineering economic analysis. Introduces present worth, annual cost, rate of return, and benefit-cost ratio methods. Use of depreciation and taxation in project analysis.

CE 3530 Professional Seminar 1 (1) Discusses various professional topics related to skills and techniques for evaluating career opportunities, seeking and obtaining civil engineering employment, career development, professional registration, professional ethics, and other factors necessary for achieving success in a professional career. Enables students to make better decisions that will help them succeed in their careers. *Preq:* Junior standing.

CE 3870 Junior Honors Project 1-3 (1-3) Studies or laboratory investigations on special topics in the civil engineering field which are of interest to individual students and faculty members. Arranged on a project basis for a maximum of individual student effort under faculty guidance. May be repeated for a maximum of three credits. *Preq:* Junior standing in Civil Engineering Senior Departmental Honors Program.

- CE 3880 Honors Research Topics 1 (0)** Survey of ongoing research in the Civil Engineering Department to identify potential research topics for further individual study. *Preq:* Junior standing in Civil Engineering Senior Departmental Honors Program.
- CE 3890 Honors Research Skills 1 (1)** Research problem selection, research tools, research reports organization. *Preq:* CE 3880.
- CE 3990 Creative Inquiry—Civil Engineering 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of four credits. *Preq:* Consent of faculty member/mentor.
- CE 4010* Matrix Structural Analysis 3 (3)** Analysis of determinate and indeterminate structures using the matrix formulation of the direct stiffness method. Consideration is given to commonly faced computer modeling issues and the nonlinear analysis of structures. *Preq:* CE 3010.
- CE 4020 Reinforced Concrete Design 3 (3)** Design of reinforced concrete beams, slabs, columns and footings using ultimate strength design. An introduction to working stress analysis is also included. *Preq:* CE 3010.
- CE 4040* Masonry Structural Design 3 (3)** Introduction to design of structural elements for masonry buildings, including lintels, walls, shear walls, columns, pilasters, and retaining walls. Reinforced and unreinforced elements of concrete or clay masonry are designed by allowable stress and strength design methods. Introduces construction techniques, materials, and terminology used in masonry. *Preq:* CE 3010.
- CE 4060 Structural Steel Design 3 (3)** Introduction to the design of structural elements found in steel buildings, in particular the design of steel tension members, beams, columns, beam-columns, and connections. Emphasizes the AISC-LRFD Specifications for steel design, though reference is made to the ASD Specification with comparisons made where appropriate. *Preq:* CE 3010.
- CE 4070* Wood Design 3 (3)** Introduction to wood design and engineering; properties of wood and wood-based materials; design of beams, columns, walls, roofs, panel systems, and connections. *Preq:* CE 3010.
- CE 4080* Structural Loads and Systems 3 (3)** In-depth discussion of minimum design loads and load combinations. Includes overview of various steel and concrete systems. Discusses practical selection and design issues and design of proprietary building materials and components such as steel joists, diaphragms, engineered wood products, etc. *Preq:* CE 3010.
- CE 4100* Traffic Engineering: Operations 3 (3)** Basic characteristics of motor-vehicle traffic, highway capacity, applications of traffic control devices, traffic design of parking facilities, engineering studies, traffic safety, traffic laws and ordinances, and public relations. *Preq:* CE 3110.
- CE 4110* Roadway Geometric Design 3 (2)** Geometric design of roadways, at-grade intersections, and interchanges in accordance with conditions imposed by driver ability, vehicle performance, safety, and economics. *Preq:* CE 3110. *Coreq:* CE 4111.
- CE 4111* Roadway Geometric Design Laboratory 0 (3)** Non-credit laboratory to accompany CE 4110. *Coreq:* CE 4110.
- CE (CRP) 4120* Urban Transportation Planning 3 (3)** Consideration of urban travel characteristics, characteristics of transportation systems, transportation and land-use studies, trip distribution and trip assignment models, city patterns and subdivision layout. May also be offered as CRP 4120. *Preq:* CE 3110.
- CE 4210* Geotechnical Engineering Design 3 (3)** Study of the relationship of local geology to soil formations, groundwater, planning of site investigation, sampling procedures, determination of design parameters, foundation design, and settlement analysis. *Preq:* CE 3210.
- CE 4240* Earth Slopes and Retaining Structures 3 (3)** Considers the principles of geology, groundwater and seepage, soil strength, slope stability, and lateral earth pressure and their application to the design of excavations, earth fills, dams, and earth-retaining structures. *Preq:* CE 3210.
- CE 4250 Soil-Structure Interaction 3 (3)** Study of the interaction between soil and structural elements such as pile foundations and retaining structures subjected to static and dynamic loads; application of general purpose finite element software for solving soil-structure interaction problems; introduction to the theory of finite element method, beams on elastic foundation, p-y curves and advanced testing procedures. *Preq:* CE 3210 and CE 3010.
- CE 4330* Construction Planning and Scheduling 3 (3)** Study of principles and applications of the Critical Path Method (CPM) and Project Evaluation and Review Techniques (PERT). Includes project breakdown and network graphics; identification of the critical path and resulting floats; definition and allocation of materials, equipment, and manpower resources; resource leveling, compression, and other network adjustments; and computer applications using packaged routines. *Preq:* CE 3310.
- CE 4340* Construction Estimating and Project Control 3 (3)** Instruction in specifications, contracts, and bidding strategies; purchasing and subcontracting policies; accounting for materials, supplies, subcontracts, and labor; procedural details for estimating earthwork, reinforced concrete, steel, and masonry. Also considers overhead and profit items. *Preq:* CE 3310.
- CE 4350* Infrastructure Project Planning 3 (3)** Covers concepts related to planning, cost estimating, financing and executing public works projects from the agency owner perspective. Advanced concepts of engineering economic analysis, risk analysis and database management systems are addressed. Traditional and innovative project contracting strategies, including incentive contracts and public-private partnerships, are discussed. *Preq:* CE 3520.
- CE 4360* Sustainable Construction 3 (3)** Presents the why, what and how for sustainable construction projects. Students gain a working understanding of how to minimize the negative impacts of buildings and other large construction projects. *Preq:* CE 3310.
- CE 4370* Sustainable Energy Project Design and Analysis 3 (3)** Students develop their technical and creative ability to plan and design for a sustainable future. Students perform quantitative analyses of the environmental and economic impacts of engineering alternatives. Students work in small groups and learn techniques for the collaborative, multidisciplinary approach required for sustainable solutions. *Preq:* CE 3310.
- CE 4380* Construction Support Operations 3 (3)** Describes activities necessary for the completion of a construction job although not specifically recognized as direct construction activities: general conditions, safety, security, quality assurance, value engineering; organizational support features and typical implementation procedures. *Preq:* CE 3310 and MATH 3020.
- CE 4390* Construction Equipment Selection and Maintenance 3 (3)** Methodology of selecting the right equipment of the right size for each task of the construction job on the basis of power-train characteristics, crew size, terrain conditions, and job requirements. Cycle time, cost, specifications, maintenance, replacement policy, monitoring. *Preq:* CE 3310.
- CE (BE) 4400* Sustainable Energy Engineering 3 (2)** Investigation into merging renewable energy resources, including detailed study of solar, wind, and bioenergy alternatives. Also includes principles, technologies, and performance evaluation of components for these technologies and an introduction to tidal, hydro, geothermal, and other energy; energy conservation; cogeneration; financial, economical, and other issues related to alternative energy sources. May also be offered as BE 4400. *Preq:* Junior standing in engineering. *Coreq:* CE 4401.
- CE (BE) 4401* Sustainable Energy Engineering Laboratory 0 (2)** Non-credit laboratory to accompany CE 4400. May also be offered as BE 4401. *Coreq:* CE 4400.
- CE 4430* Water Resources Engineering 3 (3)** Extension of the concepts of fluid mechanics to applications in water supply, water resource assessment, water transmission, water distribution networks, pump and pipe selection, pipe networks, and analysis of open channel appurtenances. *Preq:* CE 3410.
- CE 4460* Flood Hazards and Protective Design 3 (3)** Study of flood hazards and methods of protective design of the built environment; floodplain mapping and delineation; methods for determining base flood elevations. Discusses flood-resistant construction, flood proofing, and governmental regulations. Includes case studies and design projects. *Preq or concurrent enrollment:* CE 3420.

CE 4470* Stormwater Management 3 (3) Evaluation of peak discharges for urban and rural basins, design of highway drainage structures such as inlets and culverts; stormwater and receiving water quality; best management practices, detention and retention ponds, and erosion and sediment control. *Prq:* CE 3420. *Prq or concurrent enrollment:* EES 4010.

CE 4560 Pavement Design and Construction 3 (3) Introduction to design methods, construction practices, maintenance strategies, and decision making process related to pavements. Other topics, such as environmental considerations and special pavement types and materials, are also covered. *Prq:* CE 3110 and CE 3510. *Prq or concurrent enrollment:* CE 3210.

CE 4570 Materials Testing and Inspection 3 (3) Introduction to the role of testing and inspection professionals in civil engineering projects. Uses a practical approach to applying concepts to real-world situations through the completion of several team projects such as material characterization, construction QC/QA, forensic evaluation, and proposal development. *Prq:* CE 3210 and 3510.

CE 4590 Capstone Design Project 3 (1) Students apply creativity with their engineering knowledge in the solution of open-ended civil engineering problems. Problems are formulated and solutions are evaluated by faculty and practicing engineers. Communication skills are developed through presentations, correspondence and project reports. Students are expected to have completed all required 300-level CE courses and a Technical Design Requirement. *Coreq:* CE 4591.

CE 4591 Capstone Design Project Laboratory 0 (6) Non-credit laboratory to accompany CE 4590. *Coreq:* CE 4590.

CE 4620* Coastal Engineering I 3 (3) Introduction to coastal and oceanographic engineering principles, including wave mechanics, wave-structure interaction, coastal water-level fluctuations, coastal-zone processes, and design considerations for coastal structures and beach nourishment projects. *Prq:* CE 3410.

CE (GEOL) 4820* Groundwater and Contaminant Transport 3 (3) Basic principles of groundwater hydrology and transport of contaminants in groundwater systems; groundwater system characteristics; steady and transient flow; well hydraulics, design, and testing; contaminant sources, movement and transformations. May also be offered as GEOL 4820. *Prq:* Junior standing in the College of Engineering and Science and GEOL 1010.

CE 4870 Senior Honors Project 1-3 (1-3) Studies or laboratory investigations on special topics in civil engineering which are of interest to individual students and faculty members. Arranged on a project basis for a maximum of individual student effort under faculty guidance. May be repeated for a maximum of three credits. *Prq:* Senior standing in Civil Engineering Senior Departmental Honors Program.

CE 4880 Honors Research I 2-3 (2-3) Individual research under the direction of a Civil Engineering faculty member. *Prq:* CE 3890.

CE 4890 Honors Research II 3 (3) Individual research under the direction of a Civil Engineering faculty member. *Prq:* CE 4880.

CE 4900 Special Projects 1-3 (1-3) Studies or laboratory investigations on special topics in civil engineering which are of interest to individual students and staff members. Arranged on a project basis with a maximum of individual student effort and a minimum of staff guidance. May be repeated for a maximum of three credits. *Prq:* Senior standing.

CE 4910* Selected Topics in Civil Engineering 1-6 (1-6) Structured study of civil engineering topics not found in other courses. May be repeated for a maximum of six credits, but only if different topics are covered. *Prq:* Consent of instructor.

CE 4990 Creative Inquiry—Civil Engineering 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of four credits. *Prq:* Consent of faculty member/mentor.

COLLEGE OF ENGINEERING AND SCIENCE

CES 1900 Creative Inquiry in Engineering and Science I 1-3 (1-3) Individual or group projects in engineering and/or science. Projects may be interdisciplinary and involve analysis, design, and/or implementation. Instruction in methods, tools, and equipment will be included when appropriate. May be repeated for a maximum of six credits. Includes Honors sections. *Prq:* Consent of instructor.

CES 2900 Creative Inquiry in Engineering and Science II 1-3 (1-3) Individual or group projects in engineering and/or science. Projects may be interdisciplinary and involve analysis, design, and/or implementation. Instruction in methods, tools, and equipment will be included when appropriate. May be repeated for a maximum of six credits. Includes Honors sections. *Prq:* Sophomore standing and consent of instructor.

CES 3900 Creative Inquiry in Engineering and Science III 1-3 (1-3) Individual or group projects in engineering and/or science. Projects may be interdisciplinary and involve analysis, design, and/or implementation. Instruction in methods, tools, and equipment will be included when appropriate. May be repeated for a maximum of six credits. Includes Honors sections. *Prq:* Junior standing and consent of instructor.

CES 4900 Creative Inquiry in Engineering and Science IV 1-3 (1-3) Individual or group projects in engineering and/or science. Projects may be interdisciplinary and involve analysis, design, and/or implementation. Instruction in methods, tools, and equipment will be included when appropriate. May be repeated for a maximum of six credits. Includes Honors sections. *Prq:* Senior standing and consent of instructor.

CHEMISTRY

Professors: D.P. Arya, G.D. Chumanov, S.E. Creager, R.K. Dieter, S.J. Hwu, A.L. Kholodenko, J.W. Kolis, R.K. Marcus, W.T. Pennington Jr., D. Perahia, S.J. Stuart, Y.P. Sun, J.S. Thrasher; *Associate Professors:* J.N. Anker, J. Brumaghim, B.N. Dominy, J.D. McNeill, R.C. Smith; *Assistant Professors:* L.B. Casabianca, A.G. Tennyson, M. Wetzler, D.C. Whitehead; *Lecturers:* O.E. Geiculescu, T. Hickman, T.I. Houjeiry, A. Kitaygorodsky, A. Kreider-Muller, C. McMillen, S. O'Connor, J. Schroeder, S.J. Schvaneveldt, D.F. Taylor, C.A. Wilson; *Instructor:* B.S. Lewis

CH 1010 General Chemistry 4 (3) Introduction to the elementary concepts of chemistry through classroom and laboratory experience. Emphasizes chemical reactions and the use of symbolic representation, the mole concept and its applications and molecular structure. Includes Honors sections. Credit toward a degree will be given for only one of CH 1010 and CH 1050. *Prq:* CMPT score of 60 or higher; or CH 1040 or MATH 1050; or MATH 1010 or MATH 1020 or MATH 1030 with a C or better; or *Prq or concurrent enrollment:* MATH 1040 or MATH 1060 or MATH 1070 or MATH 1080 or MATH 2060 or MATH 2080 or STAT 2300. *Coreq:* CH 1011.

CH 1011 General Chemistry Laboratory 0 (3) Non-credit laboratory to accompany CH 1010. *Coreq:* CH 1010.

CH 1020 General Chemistry 4 (3) Continuation of CH 1010, treating solutions, rates of reactions, chemical equilibrium, electrochemistry, chemistry of selected elements, and an introduction to organic chemistry. Credit toward a degree will be given for only one of CH 1020 or CH 1060. Includes Honors sections. *Prq:* CH 1010 with a C or better. *Coreq:* CH 1021.

CH 1021 General Chemistry Laboratory 0 (3) Non-credit laboratory to accompany CH 1020. *Coreq:* CH 1020.

CH 1040 Concepts in Chemistry 2 (2) Covers chemical ideas and mathematical skills as applied to important topics including the particulate nature of matter, visualization of chemical behavior, and application of mathematical principles to describe chemical systems. Students who have received credit for any other chemistry course will not be allowed to enroll in or receive credit for CH 1040. To be taken Pass/No Pass only.

CH 1050 Chemistry in Context I 4 (3) The chemistry of societal issues, including air quality, global warming, acid rain, and alternative energy sources is discussed in the context of their impact on society. May not be taken as a prerequisite for organic chemistry. Credit toward a degree will be given for only one of CH 1010 or CH 1050. *Coreq:* CH 1051.

CH 1051 Chemistry in Context I Laboratory 0 (3) Non-credit laboratory to accompany CH 1050. *Coreq:* CH 1050.

CH 1060 Chemistry in Context II 4 (3) Continuation of CH 1050. Topics include the chemistry of nuclear energy, new energy sources, nutrition, medicines, new materials, and genetic engineering. May not be taken as a prerequisite for organic chemistry. Credit toward a degree will be given for only one of CH 1020 or CH 1060. *Prq:* CH 1010 or CH 1050. *Coreq:* CH 1061.

- CH 1061 Chemistry in Context II Laboratory 0 (3)** Non-credit laboratory to accompany CH 1060. *Coreq:* CH 1060.
- CH 1410 Chemistry Orientation 1 (1)** Lectures, discussions, and demonstrations devoted to health and safety in chemistry laboratories; use of the chemical literature; and career planning. *Preq or concurrent enrollment:* CH 1010.
- CH 1520 Chemistry Communication I 2 (2)** Methods for scientific communication, including oral, written, and electronic formats. Service-learning projects engage participants with community needs pertaining to chemistry issues.
- CH 1990 Creative Inquiry—Chemistry I 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.
- CH 2010 Survey of Organic Chemistry 3 (3)** Introduction to organic chemistry emphasizing nomenclature, classes of organic compounds, and chemistry of functional groups. For students needing a one-semester course in organic chemistry. Credit toward a degree will be given for only one of CH 2010 or CH 2230. *Preq:* CH 1020.
- CH 2020 Survey of Organic Chemistry Laboratory 1 (3)** Laboratory emphasizing standard techniques of organic laboratory analysis with the synthesis and characterization of organic molecules discussed in CH 2010. Credit will be given for only one of CH 2020 or CH 2270. *Preq:* CH 1020. *Preq or concurrent enrollment:* CH 1010.
- CH 2050 Introduction to Inorganic Chemistry 3 (3)** One semester treatment which emphasizes the properties and reactions of the more common chemical elements. *Preq:* CH 1020.
- CH 2230 Organic Chemistry 3 (3)** Introductory course in the principles of organic chemistry and the derivation of these principles from a study of the properties, preparations, and interrelationships of the important classes of organic compounds. Credit toward a degree will be given for only one of CH 2010 or CH 2230. *Preq:* CH 1020.
- CH 2240 Organic Chemistry 3 (3)** Continuation of CH 2230. *Preq:* CH 2230.
- CH 2270 Organic Chemistry Laboratory 1 (3)** Synthesis and properties of typical examples of the classes of organic compounds. Credit toward a degree will be given for only one of CH 2020 or CH 2270 or CH 2290. *Preq or concurrent enrollment:* CH 2230.
- CH 2280 Organic Chemistry Laboratory 1 (3)** Continuation of CH 2270. *Preq:* CH 2270. *Preq or concurrent enrollment:* CH 2240.
- CH 2290 Organic Chemistry Laboratory 1 (3)** One-semester laboratory for Chemical Engineering students. Credit toward a degree will be given for only one of CH 2270 or CH 2290. *Preq:* CH 2230.
- CH 2990 Creative Inquiry—Chemistry II 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.
- CH 3130 Quantitative Analysis 3 (3)** Fundamental principles of volumetric, gravimetric, and certain elementary instrumental chemical analyses. *Preq or concurrent enrollment:* CH 3150 or CH 3170.
- CH 3150 Quantitative Analysis Laboratory 2 (6)** Laboratory techniques of volumetric, gravimetric, and elementary instrumental chemical analyses. Credit toward a degree will be given for only one of CH 3150 or CH 3170. *Preq or concurrent enrollment:* CH 3130.
- CH 3170 Quantitative Analysis Laboratory 1 (3)** Standard techniques of analytical chemistry—gravimetric, volumetric, and instrumental. Credit toward a degree will be given for only one of CH 3150 or CH 3170. *Preq or concurrent enrollment:* CH 3130.
- CH 3300 Introduction to Physical Chemistry 3 (3)** One-semester treatment of physical chemistry emphasizing topics that are especially useful in the life sciences, agriculture, and medicine: chemical thermodynamics, equilibrium, solutions, kinetics, electrochemistry, macromolecules, and surface phenomena. Credit toward a degree will be given for only one of CH 3300 or CH 3310. *Preq:* MATH 1060.
- CH 3310 Physical Chemistry 3 (3)** Includes the gaseous state, thermodynamics, chemical equilibria, and atomic and molecular structure, from both experimental and theoretical points of view. Credit toward a degree will be given for only one of CH 3300 or CH 3310. *Preq:* MATH 2060 and PHYS 2210.
- CH 3320 Physical Chemistry 3 (3)** Continuation of CH 3310, including chemical kinetics, liquid and solid state, phase equilibria, solutions, electrochemistry and surfaces. Includes Honors sections. *Preq:* CH 3310 or CHE 2200.
- CH 3390 Physical Chemistry Laboratory 1 (3)** Experiments are selected to be of maximum value to Chemistry and Chemical Engineering majors. *Preq or concurrent enrollment:* CH 3310 or CHE 2200.
- CH 3400 Physical Chemistry Laboratory 1 (3)** Continuation of CH 3390. *Preq or concurrent enrollment:* CH 3320.
- CH 3600 Chemical Biology 3 (3)** Introduction to the chemical foundations of biological phenomena, focusing on bioorganic, biophysical, bioinorganic, and bioanalytic chemistry principles. *Preq:* CH 2010 or CH 2230.
- CH 3990 Creative Inquiry—Chemistry III 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.
- CH 4000 Selected Topics in Chemistry 1-3 (1-3)** Comprehensive study of topics of current interest in chemistry. May be repeated for a maximum of twelve credits, but only if different topics are covered.
- CH 4010* Organometallic Chemistry 3 (3)** Organometallic compounds are useful in applications ranging from large-scale industrial reactions to antibiotics, and this versatility arises from the chemically unique metal-carbon bond. Course begins with fundamental coordination chemistry, then progresses through ligand substitution, oxidative addition/reductive elimination, catalytic transformations and polymerization reactions. Includes honors sections. *Preq:* CH 2230.
- CH 4020* Inorganic Chemistry 3 (3)** Basic principles of inorganic chemistry are discussed with special emphasis on atomic structure, chemical bonding, solid state, coordination chemistry, organometallic chemistry, and acid-base theories. The chemistry of certain selected elements is treated. Includes Honors sections. *Preq:* CH 3310 and CH 3320.
- CH 4030* Advanced Synthetic Techniques 2 (6)** Introduction to advanced laboratory techniques in synthesis and characterization of inorganic and organic compounds. Laboratory sessions consist of a set of eight experiments in modern fields of chemistry, including superconductivity, buckminsterfullerene, bioinorganic chemistry, medicinal chemistry, asymmetric synthesis, and polymer chemistry. *Preq:* CH 2050 or CH 4020; and CH 2270; and CH 2280; and CH 3400 or CH 4120.
- CH 4040* Bioinorganic Chemistry 3 (3)** Covers fundamentals of bioinorganic chemistry with review of necessary inorganic and biochemical concepts. Topics include metal uptake, transport, and storage in biological systems; functions of metals in proteins; metal ion interactions with nucleic acids; physical methods used in bioinorganic chemistry; heavy element toxicity, radiopharmaceuticals and other metalodrugs. Includes Honors sections. *Preq:* BCHM 3010 or CH 2050.
- CH 4110* Instrumental Analysis 3 (3)** Principles of operation and application of modern chemical instrumentation in the field of analytical chemistry. Topics include basic electronics, statistics, optical, mass, magnetic resonance, electron and x-ray spectroscopies, radiochemistry, and separation science. *Preq:* CH 3310. *Preq or concurrent enrollment:* CH 3320.
- CH 4120 Instrumental Analysis Laboratory 2 (5)** Reinforces principles of chemical instrumentation described in CH 4110 by practical, hands-on experience. Aspects of sample preparation, standardization, data acquisition and interpretation, and report formulation procedures common in chemical analyses are considered for a range of modern instrumental methods. *Preq or concurrent enrollment:* CH 4110.
- CH 4130 Chemistry of Aqueous Systems 3 (3)** Study of chemical equilibria in aqueous systems, especially natural waters; acids and bases, dissolved CO₂, precipitation and dissolution, oxidation-reduction, adsorption, etc. Includes Honors sections. *Preq:* CH 1020 or 1060.

- CH 4140* Bioanalytical Chemistry 3 (3)** Survey of selected areas of importance in bioanalytical chemistry. Fundamental principles, advanced topics, and applications of analytical measurements of biomolecules, bioassays, immunoassays, separations, mass spectrometry, method validation, macromolecular crystallography, microscopy, and imaging. *Preq:* CH 3130 and CH 4110.
- CH 4210* Advanced Organic Chemistry 3 (3)** Survey of modern organic chemistry emphasizing synthesis and mechanisms. Includes Honors sections. *Preq:* CH 2240.
- CH 4250* Medicinal Chemistry 3 (3)** Survey of the pharmaceutical drug discovery process. Covers discovery of candidate compounds, bioassay methods, and associated regulatory and commercial issues. Case studies are selected from the current literature. *Preq:* CH 2240.
- CH 4270* Organic Spectroscopy 3 (2)** Survey of modern spectroscopic techniques used in the determination of molecular structure. Emphasizes the interpretation of spectra: nuclear magnetic resonance, ultraviolet, infrared, mass spectroscopy, optical rotatory dispersion, and circular dichroism. Includes Honors sections. Students are expected to have completed one year each of organic chemistry and physical chemistry. *Coreq:* CH 4271.
- CH 4271* Organic Spectroscopy Laboratory 0 (3)** Non-credit laboratory to accompany CH 4270. *Coreq:* CH 4270.
- CH 4350* Atomic and Molecular Structure 3 (3)** Introduction to quantum theory and its application to atomic and molecular systems. Topics include harmonic oscillator, hydrogen atom, atomic and molecular orbital methods, vector model of the atom, atomic spectroscopy, and molecular spectroscopy. Includes Honors sections. *Preq:* CH 3320.
- CH 4360 Computational Quantum Chemistry and Electronic Structure Methods 3 (3)** Hands-on introduction to electronic structure calculations. Topics include types of quantum mechanical calculations, the theory behind *ab initio* and density functional theory methods, basis sets and basis set effects. Emphasis is placed on understanding the results of calculations and relating them to basic chemical principles. *Preq:* CH 3320.
- CH 4430 Research Problems 1-6 (3-18)** Original investigation of an assigned problem in a fundamental branch of chemistry. Work must be carried out under the supervision of a member of the staff. May be repeated for a maximum of six credits. Includes Honors sections. *Preq:* Consent of instructor.
- CH 4440 Research Problems 1-6 (3-18)** Continuation of CH 4430. Original investigation of an assigned problem in a fundamental branch of chemistry. Work must be carried out under the supervision of a member of the staff. May be repeated for a maximum of six credits. Includes Honors sections. *Preq:* Consent of instructor.
- CH 4500 Chemistry Capstone 3 (1)** Students undertake capstone projects in a team format. Projects necessitate the use of electronic and print resources, demonstrate expertise with a specific instrument or experimental technique, require strong collaboration within a team setting, and produce a peer-reviewed oral and written report. *Preq:* Senior standing. *Coreq:* CH 4501.
- CH 4501 Chemistry Capstone Laboratory 0 (6)** Non-credit laboratory to accompany CH 4500. *Coreq:* 4500.
- CH 4510* Frontiers in Polymer Chemistry 3 (3)** Survey of selected areas of current research in polymer science with particular emphasis on polymer synthesis. Although a text is required for review and reference, course is primarily literature based and focused on areas of high impact to multidisciplinary technology. *Preq:* CH 2230 and CH 2240 and MSE 4150.
- CH 4520 Chemistry Communication II 1 (1)** Methods for scientific communication, including oral, written, and electronic formats. Student presentations focus on current chemical literature topics pertinent to their CH 4430/444 undergraduate research or results of that work are appropriate. *Preq:* CH 1520.
- CH 4710* Teaching Chemistry 3 (3)** Study of topics in chemistry addressed in the context of constructivist methodologies. Also considers laboratory work and management, laboratory safety, and the use of technology in the chemistry classroom. *Preq:* Any 3000-level chemistry course. Students who have not completed a 3000-level chemistry course but have high school teaching experience may request an override from the instructor.
- CH 4990 Creative Inquiry—Chemistry IV 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.

CHEMICAL ENGINEERING

Professors: D.A. Bruce, C.H. Gooding, A. Guiseppi-Elie, D.E. Hirt, *Chair*; S.M. Husson, A.A. Ogale, M.C. Thies; *Associate Professor:* C.L. Kitchens, *Assistant Professors:* R.B. Getman, M.E. Roberts, S. Sarupia

CHE 1300 Chemical Engineering Tools 2 (1) Tools and methods for analyzing engineering problems with applications in chemical and biochemical processes, including development of process flow diagrams, numerical methods, graphing, and applied statistics. Problem-solving and computer skills are developed in the lecture and laboratory activities. *Preq:* CH 1010 and ENGR 1060, each with a C or better. *Preq or concurrent enrollment:* MATH 1060 or MATH 1070; and PHYS 1220. *Coreq:* CHE 1301.

CHE 1301 Chemical Engineering Tools Laboratory 0 (2) Non-credit laboratory to accompany CHE 1300. *Coreq:* CHE 1300.

CHE 1990 Creative Inquiry—Chemical and Biomolecular Engineering 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.

CHE 2110 Introduction to Chemical Engineering 4 (3) Introduction to fundamental concepts of chemical engineering, including mass and energy balances, PVT relationships for gases and vapors, and elementary phase equilibria; problem-solving and computer skills are developed in lab. *Preq:* CH 1020 and MATH 1080 and PHYS 1220 and CHE 1300. *Coreq:* CHE 2111.

CHE 2111 Introduction to Chemical Engineering Laboratory 0 (2) Non-credit laboratory to accompany CHE 2110. *Coreq:* CHE 2110.

CHE 2200 Chemical Engineering Thermodynamics I 3 (3) Topics include first and second laws of thermodynamics, ideal gases, PVT properties of real fluids, energy balances with chemical reactions, and thermodynamic properties of real fluids. *Preq:* CHE 2110 and MATH 2060.

CHE 2300 Fluids/Heat Transfer 4 (3) General principles of chemical engineering and study of fluid flow, fluid transportation, and heat transmission. Special emphasis is placed on theory and its practical application to design. *Preq:* CHE 2110. *Preq or concurrent enrollment:* CHE 2200 and MATH 2060. *Coreq:* CHE 2301.

CHE 2301 Fluids/Heat Transfer Laboratory 0 (2) Non-credit laboratory to accompany CHE 2300. *Coreq:* CHE 2300.

CHE 2990 Creative Inquiry—Chemical and Biomolecular Engineering 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.

CHE 3000 Honors Seminar 1 (1) Acquaints students enrolled in the Departmental Honors Program with current research issues in the profession. This assists the student in preparing a research proposal for the Senior Thesis. To be taken Pass/No Pass only. *Preq:* CHE 2200 and CHE 2300; and admission to departmental honors program.

CHE 3070 Unit Operations Laboratory I 3 (2) Laboratory work in the unit operations of fluid flow, heat transfer, and evaporation. Stress is on the relation between theory and experimental results and the statistical interpretation of those results and on report preparation and presentation. *Preq:* CHE 2200 and CHE 2300. *Coreq:* CHE 3071.

CHE 3071 Unit Operations Laboratory I Laboratory 0 (3) Non-credit laboratory to accompany CHE 3070. *Coreq:* CHE 3070.

CHE 3190 Engineering Materials 3 (3) Introduction to the fundamental properties and behavior of engineering materials emphasizing polymers, metals, ceramics, and composite materials. *Preq:* CHE 2110. *Preq or concurrent enrollment:* CH 2230 and CHE 2200.

CHE 3210 Chemical Engineering Thermodynamics II 3 (3) Continuation of CHE 2200. Topics include thermodynamics of power cycles and refrigeration/liqefaction, thermodynamic properties of homogeneous mixtures, phase equilibria, and chemical reaction equilibria. *Preq:* CHE 2200 and MATH 2080.

- CHE 3300 Mass Transfer and Separation Processes 4 (3)** Study of mass transport fundamentals and application of these fundamentals to separation technologies, with emphasis on gas absorption, stripping, distillation, and liquid-liquid extraction. *Preq:* CHE 2300. *Preq or concurrent enrollment:* CHE 3210. *Coreq:* CHE 3301.
- CHE 3301 Mass Transfer and Separation Processes Laboratory 0 (2)** Non-credit laboratory to accompany CHE 3300. *Coreq:* CHE 3300.
- CHE 3530 Process Dynamics and Control 3 (3)** Mathematical analysis of the dynamic response of process systems. Basic automatic control theory and design of control systems for process applications. *Preq:* CHE 2300 and MATH 2080. *Preq or concurrent enrollment:* CHE 3300.
- CHE 3950 Honors Research I 3 (9)** Individual research under the direction of a Chemical Engineering faculty member. *Preq:* CHE 3000.
- CHE 3990 Creative Inquiry—Chemical and Biomolecular Engineering 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.
- CHE 4010* Transport Phenomena 3 (3)** Mathematical analysis of single and multidimensional steady-state and transient problems in momentum, energy, and mass transfer. Both the similarities and differences in these mechanisms are stressed. *Preq:* CHE 3300 and MATH 2080.
- CHE 4070 Unit Operations Laboratory II 3 (1)** Continuation of CHE 3070 with experiments primarily on the diffusional operations. Additional lecture material on report writing and general techniques for experimental measurements and analysis of data, including statistical design of experiments. *Preq:* CHE 3070 and CHE 3300. CHE 4071.
- CHE 4071 Unit Operations Laboratory II Laboratory 0 (6)** Non-credit laboratory to accompany CHE 4070. *Coreq:* CHE 4070.
- CHE 4120* Polymer Engineering 3 (3)** Design-oriented course in synthetic polymers. Topics include reactor design used in polymer production, effect of step versus addition kinetics on reactor design, epoxy curing reactions, polymer solubility, influence of polymerization and processing conditions on polymer crystallinity. *Preq:* CH 2240 and CH 3320.
- CHE 4310 Chemical Process Design I 3 (3)** Steps in creating a chemical process design from original concept to successful completion and operation. Topics include process layout, equipment selection and sizing, safety and environmental evaluation, engineering economics, simulation, evaluation of alternatives, and optimization. *Preq:* CHE 3070 and CHE 3210 and CHE 3300. *Preq or concurrent enrollment:* CHE 4500.
- CHE 4330 Process Design II 3 (1)** Continuation of CHE 4310. Principles of process development, design, and optimization are applied in a comprehensive problem carried from a general statement of the problem to detailed design and economic evaluations. *Preq:* CHE 3300 and CHE 4070 and CHE 4310 and CHE 4500. *Coreq:* CHE 4331.
- CHE 4331 Process Design II Laboratory 0 (6)** Non-credit laboratory to accompany CHE 4330. *Coreq:* CHE 4330.
- CHE 4430 Chemical Engineering Senior Seminar I 1 (1)** Preparation of senior chemical engineering students for entry into the profession. Timely information on job interviewing skills, career placement and guidance, professional registration, professional behavior and ethics, and management of personal finances. Outside speakers are used frequently. To be taken Pass/No Pass only. *Preq or concurrent enrollment:* CHE 4310.
- CHE 4440 Chemical Engineering Senior Seminar II 1 (1)** Working in groups, students present and discuss topics related to professional practice, ethics, business, industrial safety, the environment, and selected technical subjects of interest to society. To be taken Pass/No Pass only. *Preq:* CHE 4430. *Preq or concurrent enrollment:* CHE 4330.
- CHE 4450* Selected Topics in Chemical Engineering 3 (3)** Topics not covered in other courses, emphasizing current literature, research, and practice of chemical engineering. Topics vary from year to year. May be repeated, but only if different topics are covered. *Preq:* Consent of instructor.
- CHE 4500* Chemical Reaction Engineering 3 (3)** Review of kinetics of chemical reactions and an introduction to the analysis and design of chemical reactors. Topics include homogeneous and heterogeneous reactions, batch and continuous flow reaction systems, catalysis, and design of industrial reactors. *Preq:* CHE 3210 and CHE 3300 and CH 3320.
- CHE 4910* Special Projects in Chemical Engineering 1-3 (1-3)** Topics requested by students or offered by faculty as the need arises. Topics may include review of current research in an area, technological advances, and national engineering goals. May be repeated for a maximum of six credits, but only if different topics are covered. Includes Honors sections.
- CHE 4950 Honors Research II 3 (9)** Individual research under the direction of a chemical engineering faculty member. *Preq:* CHE 3950.
- CHE 4970* Honors Thesis 1 (1)** Preparation of honors thesis based on research conducted in CHE 3950 and CHE 4950. *Preq:* CHE 4950.
- CHE 4990 Creative Inquiry—Chemical and Biomolecular Engineering 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.
- CHINESE**
Associate Professors: Y. An, Y. Zhang; *Lecturer:* S. Chen
- CHIN 1010 Elementary Chinese 4 (3)** Introductory course stressing speaking, listening, and writing. Attention is given to the sound system of Chinese to enable students to distinguish the four tones and to develop basic communication skills. Participation in cultural activities is encouraged. *Coreq:* CHIN 1011.
- CHIN 1011 Elementary Chinese Laboratory 0 (1)** Non-credit laboratory to accompany CHIN 1010. *Coreq:* CHIN 1010.
- CHIN 1020 Elementary Chinese 4 (3)** Continuation of CHIN 1010. *Preq:* CHIN 1010. *Coreq:* CHIN 1021.
- CHIN 1021 Elementary Chinese Laboratory 0 (1)** Non-credit laboratory to accompany CHIN 1020. *Coreq:* CHIN 1020.
- CHIN 2010 Intermediate Chinese 3 (3)** Intermediate course with more emphasis on communication skills and structure. Reading and writing practice without phonetic aids; oral practice in and outside the class, paying special attention to idiomatic usage; introduction to cultural perspectives through readings and cultural activities. *Preq:* CHIN 1020. *Coreq:* CHIN 2011.
- CHIN 2011 Intermediate Chinese Laboratory 0 (1)** Non-credit laboratory to accompany CHN 2010. *Coreq:* CHIN 2010.
- CHIN 2020 Intermediate Chinese 3 (3)** Continuation of CHIN 2010. *Preq:* CHIN 2010. *Coreq:* CHIN 2021.
- CHIN 2021 Intermediate Chinese Laboratory 0 (1)** Non-credit laboratory to accompany CHIN 2020. *Coreq:* CHIN 2020.
- CHIN 2970 Creative Inquiry—Chinese 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration. *Preq:* Consent of faculty member(s).
- CHIN 3050 Chinese Conversation and Composition I 3 (3)** Practice in the spoken language emphasizing vocabulary, word-combinations, pronunciation, and comprehension. Learning practical language skills and intercultural communication by studying various topics. *Preq:* CHIN 2020
- CHIN 3060 Chinese Conversation and Composition II 3 (3)** Continuation of CHIN 3050. More practice in the spoken language emphasizing vocabulary, word combinations, pronunciation, and comprehension. Learning practical language skills and intercultural communication by studying various topics. *Preq:* CHIN 3050.
- CHIN (PHIL) 3120 Philosophy in Ancient China 3 (3)** Study of the history of Chinese philosophy from fifth century BCE, including Confucianism, Daoism, Moism, legalism, Buddhism, Neo-Daoism, and Neo-Confucianism. Examination of Chinese philosophers' views and arguments on questions of life and death, history and society, education and personal cultivation. May not be used to satisfy general foreign language requirements. May also be offered as PHIL 3120.
- CHIN (PHIL) 3130 Philosophy in Modern China 3 (3)** Study of the history of Chinese philosophy from the 19th century BCE, including Confucianism, Daoism, Moism, legalism, Buddhism, Neo-Daoism, and Neo-Confucianism. Examination of Chinese philosophers' views and arguments on questions of life and death, history and society, education and personal cultivation. May not be used to satisfy general foreign language requirements. May also be offered as PHIL 3130.

- CHIN 3160 Chinese for International Trade I 3 (3)** Study of spoken and written Chinese common to the Chinese-speaking business communities emphasizing business practices and writing/translating business letters and professional documents. Cross-cultural references are provided for comparative analyses of American and Chinese business behavior. Classes are conducted in Chinese. *Preq or concurrent enrollment:* CHIN 2020 and CHIN 3050.
- CHIN 3170 Chinese for Health Professionals I 3 (3)** Study of medical concepts and terminology emphasizing communicative competence in health-related settings in a Chinese-speaking community. Designed for students who plan to work in public health related professions. *Preq:* CHIN 2020 and CHIN 3050.
- CHIN 3970 Creative Inquiry—Chinese 1-4 (1-4)** Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.
- CHIN 3980 Directed Reading 3 (3)** Directed readings in Chinese literature, language, society, and culture. Taught in Chinese. May be repeated for a maximum of six credits. *Preq:* Consent of department chair.
- CHIN 4010 Pre-Modern Chinese Literature in Translation 3 (3)** Chinese literature from 8th century B.C.E. to 19th century C.E., including poetry, prose, drama, fiction, and literary criticism. All readings and discussions are in English.
- CHIN 4110 Studies in the Chinese Language I: Literature 3 (3)** Advanced training in the spoken and written language through readings in contemporary literature emphasizing vocabulary, syntax, and stylistics. All readings and discussions are in Chinese. *Preq:* CHIN 3060.
- CHIN 4120 Studies in the Chinese Language II: Social Issues 3 (3)** In-depth study of terminology and syntax for specific subject areas in contemporary social issues. All readings and discussions are in Chinese. *Preq:* CHIN 3060.
- CHIN 4160 Chinese for International Trade II 3 (3)** Study of language, concepts, and the environment of Chinese-speaking markets of the world. Considers sociocultural, political, and economic issues relevant to the Chinese-speaking business world and the ramifications of these issues in global marketing. Classes are conducted in Chinese. *Preq:* CHIN 3160.
- CHIN 4170 Chinese for Health Professionals II 3 (3)** Continuation of CHIN 3170 with increased emphasis on managerial aspects of the health-care system in China. Taught in Chinese. *Preq:* CHIN 3170.
- CHIN (ANTH) 4180 Chinese Culture and Society 3 (3)** Examines basic cultural values and the patterns of Chinese social life. Focuses on Chinese social organization and interpersonal dynamics, including the family system, gender identities, social exchanges and networks. All readings and discussions are in English. May not be used to satisfy general foreign language requirements. May also be offered as ANTH 4180.
- CHIN 4970 Creative Inquiry—Chinese 1-4 (1-4)** Continuation of research initiated in CHIN 3970. Students complete their projects and disseminate their research results. *Preq:* CHIN 3970.
- CHIN 4980 Independent Study 1-3 (1-3)** Supervised study and research on selected topics in Chinese studies. May be repeated for a maximum of six credits. *Preq:* Junior standing and consent of department chair.
- CHIN 4990 Selected Topics in Chinese Culture 3 (3)** Examination of various social and cultural topics, including art and literature, philosophical and religious traditions, health and healing, and folk and popular cultures. May be repeated for a maximum of six credits, but only if different topics are covered. Readings and discussions are in English. May not be used to satisfy general foreign language requirements.

COMMUNICATION STUDIES

Professor: B.E. Denham; *Associate Professor:* K.O. Jones, *Chair;* *Assistant Professors:* E. Ash, C. Kumanyika, D.L. Linvill, J.P. Mazer, A.N. Pratt, A.S. Pyle, S.M. Rhul, J. Sanderson, D.T. Scott, J. Spinda, M.R. Weathers; *Senior Lecturers:* A.Z. Davis, M.H. Glaser, E.R. Smith; *Lecturers:* C. Baker, B. Boatwright, A. Davis, L. Dixon, L. Fecher, P. Matthey, M. Pugh, K. Schoonover, J. Taweh

COMM 1010 Communication Academic and Professional Development I 1 (1) Introduces students to General Education and Communication Studies major requirements, explains connections between general education and major courses, explores careers in communication, and prepares students to develop digital portfolios, résumés, and interview skills specific to communication professions and/or graduate school. To be taken Pass/No Pass only.

COMM 1070 Media Representations of Science and Technology 3 (3) Examines mediated representations of science and technology from a communication perspective. Attention is paid to portrayals/coverage of science and technology in popular film, television, Internet, journalism, and other media. Students examine an array of theoretical issues and case studies in this area.

COMM 1500 Introduction to Human Communication 3 (2) Overview of theoretical approaches to the study of communication, including the theory and practice of interpersonal/small group/intercultural/public communication. Includes a laboratory. *Coreq:* COMM 1501.

COMM 1501 Introduction to Human Communication Laboratory 0 (2) Non-credit laboratory to accompany COMM 1500. *Coreq:* COMM 1500.

COMM 1620 Forensic Laboratory 1 (3) Research, preparation, and practice leading to participation in on-campus and intercollegiate debate and individual events competition. May be repeated for a maximum of four credits.

COMM 1630 Advanced Forensic Laboratory 1 (3) Advanced research, preparation, and practice leading to continued participation in on-campus and intercollegiate debate and individual events competition. May be repeated for a maximum of four credits. *Preq:* COMM 1620.

COMM 1800 Introduction to Cross-Cultural Communication 3 (3) Introductory course designed to provide an overview to intercultural communication questions stemming from the growing diversity and interconnectedness of the world. Students are challenged to learn about the ways people from different cultural backgrounds think, communicate and behave based on the value systems and worldviews that ground them.

COMM 2010 Introduction to Communication Studies 4 (3) Introduces Communication Studies majors to and prepares them for continued study in the discipline by providing them with an overview of important issues, areas of study, and approaches to the field. Includes a writing laboratory experience. *Preq:* COMM 1010. *Coreq:* COMM 2011.

COMM 2011 Introduction to Communication Studies Laboratory 0 (2) Non-credit laboratory to accompany COMM 2010. *Coreq:* COMM 2010.

COMM 2500 Public Speaking 3 (3) Practical instruction in public speaking; practice in the preparation, delivery, and criticism of short speeches. Develops an understanding and knowledge of the process of communication. Includes a laboratory. Includes Honors sections. *Coreq:* COMM 2501.

COMM 2501 Public Speaking Laboratory 0 (1) Non-credit laboratory to accompany COMM 2500. *Coreq:* COMM 2500.

COMM 3010 Communication Theory 3 (3) Students explore the breadth and depth of theories within the major frameworks of the communication studies discipline. *Preq:* COMM 2010 with a C or better.

COMM 3020 Mass Communication Theory 3 (3) Survey of the breadth and history of theories of mass communication and mass media from the 19th century to the present. Emphasizes contemporary schools of thought, theoretical debates, and the continuing controversies in the field. *Preq:* COMM 2010 with a C or better.

COMM 3030 Communication Law and Ethics 3 (3) Major topics in communication law and free expression and in communication ethics. *Preq:* COMM 2010 with a C or better.

COMM 3050 Persuasion 3 (3) Study of the processes by which communication influences attitudes, beliefs, and behaviors in our personal, social, civic, and professional lives. After discussion of definitional and methodological issues, particular theories of persuasion are examined. Treatment of political, market-driven, and social persuasion concludes the course. *Preq:* COMM 2010 with a C or better.

COMM 3060 Discourse, Criticism, and Society 3 (3) Students explore theoretically-grounded methods of critical and cultural description, analysis, interpretation, and evaluation of public discourse. *Preq:* COMM 2010 with a C or better.

COMM 3070 Public Communication of Science and Technology 3 (3) Examines the role of science and technology in society from a communication perspective. Particular attention is paid to this dynamic in public culture. Students examine an array of theoretical issues and case studies in this area. *Preq:* COMM 2010 with a C or better.

- COMM 3080 Public Communication and Popular Culture 3 (3)** Examines artifacts of popular culture, paying particular attention to their relationship to politics and public life. Explores the structures and constraints of the culture industry. Students apply communication principles to various examples. *Preq:* COMM 2010 with a C or better.
- COMM 3090 Visual Discourse and the Public 3 (3)** Examines the role of visibility in society and the cultural implications for ways of seeing. Using visual artifacts of various types, students learn the logic of visual representation. *Preq:* COMM 2010 with a C or better.
- COMM 3100 Quantitative Research Methods in Communication Studies 3 (3)** Explores methods of quantitative communication inquiry, including theory/research relationship, conducting studies, and utilizing statistical software. Methods may include experiments, surveys, and content analysis. *Preq:* COMM 2010 with a C or better.
- COMM 3110 Qualitative Research Methods in Communication Studies 3 (3)** Explores methods of qualitative communication inquiry, including theory/research relationship and conducting studies. Methods may include interviewing, focus groups, textual analysis, and ethnography. *Preq:* COMM 2010 with a C or better.
- COMM 3150 Critical Discourse Theory 3 (3)** Introduction to a variety of theoretical concepts associated with the critical study of public discourse. Students analyze theories related to the strategic use of language and its epistemological characteristics. Theoretical topics may include critical/cultural studies, visual communication, ideology, persona, social change, and identity studies. *Preq:* COMM 2010 with a C or better.
- COMM (WS) 3160 Girlhood, Media, and Popular Culture 3 (3)** Explores how the mass media and popular culture contribute to social constructions of girlhood. Employing the critical lens of feminist and communication theories, students examine mediated depictions of girls as well as how girls actively produce and negotiate media and popular culture. May also be offered as WS 3160. *Preq:* COMM 2010 with a C or better or WS 3010.
- COMM 3200 Broadcast Production 3 (2)** Explores the broadcast side of journalism. Students produce broadcast video packages, as well as newscasts. Students learn news writing, filming and video editing. *Coreq:* COMM 3201.
- COMM 3201 Broadcast Production Laboratory 0 (2)** Non-credit laboratory to accompany COMM 3200. *Coreq:* COMM 3200.
- COMM 3210 Communication Across Media Platforms 3 (3)** Provides an overview of the communication convergence strategies and practices used across multiple media platforms, including print, broadcast, Internet and social media. Emphasis is placed on media law, ethics and communication practices used across multiple media platforms. *Preq:* COMM 2010 with a C or better.
- COMM 3220 Communication Design 3 (2)** Provides an overview of the communication theories, tools and techniques available to design, manipulate and convey technological messages and experiences in digital contexts. Provides knowledge and critical skills necessary to consider communication design as an important and inevitable component of communication studies careers.
- COMM 3221 Communication Design Laboratory 0 (2)** Non-credit laboratory to accompany COMM 3220.
- COMM 3240 Communication, Sport and Society 3 (3)** Covers the cultural influence of communication about sports on society. Explores how communication enables cultural meanings and values to become associated and established within sports. Exposes students to the ways factors such as race, gender and nationalism manifest and perpetuate via communication about sports. *Preq:* COMM 2010 with a C or better.
- COMM 3250 Survey of Sports Communication 3 (3)** Covers fundamentals of communicating in a sports environment. Includes the basics of communicating for print and broadcast news, as well as communicating for sports information. Also covers ethical considerations in sports communications. *Preq:* COMM 2010 with a C or better.
- COMM 3260 Public Relations in Sports 3 (3)** Focuses on the preparation of professional sports communication materials for both internal and external audiences. Topics include the mechanics of creating press releases and other materials, as well as techniques in managing crises. *Preq:* COMM 2010 with a C or better.
- COMM 3270 Sports Media Criticism 3 (3)** Students gain in-depth understanding of sports communication issues through critically analyzing actual media coverage of sporting events, addressing social issues involved in college and professional sports, and developing an understanding of sports promotion and advertising. *Preq:* COMM 2010 with a C or better.
- COMM 3300 Nonverbal Communication 3 (3)** Develops a knowledge of the functions of nonverbal behaviors in human interaction. This includes the study of gesture and movement, physical appearance, vocal behavior, immediacy, time and space, and intercultural differences. Promotes understanding of nonverbal rules. *Preq:* COMM 2010 with a C or better.
- COMM 3480 Interpersonal Communication 3 (3)** Survey of the theories and research in interpersonal communication with emphasis on the application of research findings and developmental strategies for intra- and intercultural relationships. *Preq:* COMM 2010 with a C or better.
- COMM 3500 Small Group and Team Communication 3 (3)** Examines the principles and skills involved in effective small-group communication. *Preq:* COMM 2010 with a C or better.
- COMM 3550 Principles of Public Relations 3 (3)** Students learn the principles, theories, process, history and contexts of public relations. *Preq:* COMM 2010 with a C or better.
- COMM 3560 Stakeholder Communication 3 (3)** Focuses on external stakeholders such as the media, the community, and the government. Students learn theory- and research-based communication tactics to manage various stakeholder relationships. *Preq:* COMM 3550.
- COMM 3610 Argumentation and Debate 3 (3)** Basic principles of argumentation with emphasis on developing skills in argumentative speech. The role of the advocate in contemporary society with an emphasis on and an appreciation of formal debate. *Preq:* COMM 2500.
- COMM 3620 Communication and Conflict Management 3 (3)** Introduces the study of communication practices in conflict situations within various personal and professional settings. Emphasis is on the central role of communication in the understanding and management of conflict. *Preq:* COMM 2010 with a C or better.
- COMM 3640 Organizational Communication 3 (3)** Examination of the process, theories, and techniques of communications within small groups and other organized bodies. *Preq:* COMM 2010 with a C or better.
- COMM 3660 Special Topics in Communication Studies 3 (3)** Consideration of select major areas of practice in the field with a focus on application of communication concepts. May be repeated for a maximum of nine credits, but only if different topics are covered.
- COMM 3680 Applied Communication 3 (3)** Students apply and develop practical knowledge and skills relevant to specific research areas in communication studies as determined by instructor. Areas may include organizational, health, media and technological communication. *Preq:* COMM 2010 with a C or better; and COMM 3060 or 3100 or 3110, each with a C or better.
- COMM 3690 Political Communication 3 (3)** Examination of American political rhetoric after 1900, focusing on such notable speakers as Franklin D. Roosevelt, John F. Kennedy, and Martin Luther King Jr. *Preq:* COMM 2010 with a C or better.
- COMM 3900 Communication Studies Internship 3 (9)** Preplanned, preapproved, faculty-supervised internship provides Communication Studies majors with field experience in areas related to their curriculum. May be repeated for a maximum of six credits. To be taken Pass/No Pass only. *Preq:* Junior standing and consent of faculty advisor.
- COMM 3990 Creative Inquiry in Communication Studies 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue small group work on a particular research topic or practical problem. Arrangements with mentors must be established prior to registration. Content varies. May be repeated for a maximum of nine credits. *Preq:* COMM 2010 with a C or better.
- COMM 4000 Communication and Globalization 3 (3)** In-depth examination of the role communication plays in globalization processes, including case studies of contemporary social, technical, professional and ethical issues. *Preq:* COMM 2010 with a C or better.

- COMM 4020 Mass Communication: History and Criticism 3 (3)** Critical examination of mass communication in America, including discussions of history, theory, and current issues in television, film, popular music, telecommunications, and other media. *Preq:* COMM 2010 with a C or better.
- COMM 4040* Media Communication and Social Identities 3 (3)** Examines the communication of individual and social identities in convergent and mass/social media, and popular culture. Focuses on the communication of identity portrayals and representations, communicative acts in response, and how individuals and groups navigate and create their own media cultures. Addresses factors such as ability, faith, gender, race, age, nationality, subcultures, and/or other areas. *Preq:* COMM 2010 with a C or better.
- COMM 4050 Public Contest and Change 3 (3)** Examines the role of public communication in the process of contesting social values and practices and in the subsequent change that sometimes occurs. Students explore the public's relationship with mass media as well as other forms of communication practices that can produce cultural change. *Preq:* COMM 2010 with a C or better and COMM 3050.
- COMM 4250 Advanced Sports Communication 3 (3)** Combination seminar and primary research class that explores contemporary sports communication issues. Students write position papers on seminar topics and conduct primary research on sports communication topics of their choice. *Preq:* COMM 3250.
- COMM 4260 Social Media and Sports Communication 3 (3)** Covers the influence of communication and social media in sports and how these technologies are changing the communicative infrastructure of sports. Students explore how social media is re-configuring sports media, how sports organizations are managing social media, and how social media affects fan behavior and athlete communication. *Preq:* COMM 2010 with a C or better.
- COMM 4270 Communication in Sports Organizations 3 (3)** Examines communication dynamics in sports organizations. Among others, topics may include identifying how sports organizations manage crisis communication, communication with stakeholders, sexual harassment, ethical issues, and dissent. *Preq:* COMM 2010 with a C or better.
- COMM 4280 Interpersonal/Family Communication and Sport 3 (3)** Examines how communication functions in interpersonal and family contexts as it pertains to sports. Exposes students to positive and negative communicative behavior with athletes, coaches and families. Challenges students to identify ways that sports can be a healthy, rather than destructive, communicative topic for families and interpersonal relationships. *Preq:* COMM 2010 with a C or better.
- COMM 4300 Legal Communication 3 (3)** Explores the theory and practice of communication in the legal setting, including the trial and appeal processes. Emphasizes the importance of effective communication in the legal profession.
- COMM 4310 Legal Communication Trial 3 (3)** Advanced study in communication and the law, legal analysis and the elements of trial preparation, including out of court preparation, jury selection, limited motion practice, opening statements, direct examination and cross examination of witnesses, closing arguments, and jury charges. *Preq:* COMM 4300.
- COMM (ENGL) 4510* Film Theory and Criticism 3 (2)** Advanced study into the theory of film/video making emphasizing understanding a variety of critical methods to approach a film. Examines the history of film theory and defines the many schools of film criticism, including realism, formalism, feminism, semiotics, Marxism, and expressionism. May also be offered as ENGL 4510. *Preq:* ENGL 3570. *Coreq:* COMM 4511.
- COMM (ENGL) 4511* Film Theory and Criticism Laboratory 0 (3)** Non-credit laboratory to accompany COMM 4510. May also be offered as ENGL 4511. *Coreq:* COMM 4510.
- COMM 4550 Gender Communication 3 (3)** Explores the ways communication behavior and perceptions of communication behavior are affected by gender. The effects of gender on a variety of communication contexts are examined, including interpersonal, small group, organizational, and mass communication. *Preq:* COMM 2010 with a C or better.
- COMM 4560 Strategic Communication for Social Change 3 (3)** In-depth examination and application of the strategic use of communication for creating social change. *Preq:* COMM 3100 or COMM 3110; and COMM 3560.
- COMM 4620 Communication and Negotiation 3 (3)** Building on the concepts and practices of conflict management, students develop knowledge and skills for distributive bargaining and integrative negotiation climates. Focuses on the objectives, goals, positions, interests, tactic, and other elements to negotiate successfully in a variety of situations. *Preq:* COMM 3620.
- COMM 4640* Advanced Organizational Communication 3 (3)** Application of communication theory and research to the analysis of particular organizational communication processes. Students study significant issues and/or methods of intervention and innovation in organizational communication. *Preq:* COMM 3640.
- COMM 4660 Advanced Special Topics in Communication Studies 3 (3)** Consideration of specialized areas of study in the field, emphasizing theoretical depth or extensive research. May be repeated for a maximum of nine credits, but only if different topics are covered. *Preq:* Junior or senior standing.
- COMM 4700* Communication and Health 3 (3)** Considers institutional and health care communication issues as well as the relationship between social issues, communication, and health. *Preq:* COMM 2010 with a C or better.
- COMM 4800 Intercultural Communication 3 (3)** Introduces the process of communication between and among individuals from different cultures or subcultures. Emphasizes the effect of cultural practices within various communication relational contexts such as interpersonal, small group, and organizational communication. *Preq:* COMM 2010 with a C or better.
- COMM (ENGL) 4910* Classical Rhetoric 3 (3)** Traces the development of rhetoric from Protagoras through Isocrates, Plato, Aristotle, Cicero and Quintilian and considers questions essential to understanding persuasive theory and practices. May also be offered as ENGL 4910. *Preq:* ENGL 3100.
- COMM (ENGL) 4920* Modern Rhetoric 3 (3)** Examines the new rhetorics of the 20th century, which are grounded in classical rhetoric but include findings from biology, psychology, linguistics and anthropology, among other disciplines. May also be offered as ENGL 4920. *Preq:* ENGL 3100.
- COMM 4950 Senior Capstone Seminar 3 (3)** In-depth exploration and analysis of a special topic in Communication Studies, culminating in a senior project documented in written, oral, visual and/or multimedia presentations. Topics vary based on faculty expertise and research interests. May be repeated for a maximum of six credits. *Preq:* Senior standing in Communication Studies and one of the following courses with a C or better: COMM 3010 or COMM 3020 or COMM 3150.
- COMM 4960 Honors Creative Inquiry Capstone 3 (3)** Capstone course for honors students in the department's creative inquiry sequence. Working with their departmental honors advisor, students apply theoretical understanding and research skills in completing a written product of conference or publication length/quality. Must be taken for a total of six credits over the course of two semesters. *Preq:* Two of the following courses with a C or better in each: COMM 3060 or COMM 3100 or COMM 3110; and Senior standing in Communication Studies.
- COMM 4980 Communication Academic and Professional Development II 1 (1)** Students reflect upon curricular relationships among general education, major, and minor courses. They complete and revise digital portfolios for presentation to the major, University, graduate schools, or potential employers. Students participate in resume building, job seeking, and interviewing activities. *Preq or concurrent enrollment:* COMM 4950 or COMM 4960.
- COMM 4990 Independent Study 1-3 (1-3)** Tutorial work for students with special interests or projects in communication studies outside the scope of existing courses. May be repeated for a maximum of nine credits. *Preq:* Consent of department chair.

COMPUTER SCIENCE

Professors: A.W. Apon, *Computer Science Chair*; A.T. Duchowski, R.M. Geist III, *Interim Director*; J.E. Gilbert, *Human-Centered Computing Chair*; S.M. Hedetniemi, L.F. Hodges, D.H. House, *Visual Computing Chair*; M. Sitaraman, P.K. Srimani, J.A. Tessendorf; *Associate Professors:* T.A. Davis, B.C. Dean, W.D. Goddard, J.O. Hallstrom, F. Luo, B.A. Malloy, J.J. Martin, J.D. McGregor, R.P. Pargas, M.K. Smotherman, Z. Wang, D.L. Woodard; *Assistant Professors:* S.V. Babu, K.E. Caine, S.B. Daily, C.M. Gardner-McCune, C.S. Joerg, J.A. Levine, K.A. McMullen, S.L. Remy, I.M. Saftro, J. Sorber; *Adjunct Professors:* V. Burton, S.J. Stuart, P. Wilson; *Adjunct Associate Professor:* N. Sridhar; *Adjunct Assistant Professor:* C.A. Zanbaka; *Research Professors:* J. Taiber, J.M. Westall; *Research Associate Professor:* J.B. Gemmill; *Senior Lecturers:* C. Hochrine, R.M. Lowe, *Lecturers:* J.H. Jones, R.S. Lambert, P.D. Sterling, K.A. Weaver

CPSC 1010 Computer Science I 4 (3) Introduction to modern problem solving and programming methods. Special emphasis is placed on algorithm development and software life cycle concepts. Includes use of appropriate tools and discusses ethical issues arising from the impact of computing upon society. Intended for students concentrating in computer science or related fields. Includes Honors sections. *Preq or concurrent enrollment:* MATH 1020 or MATH 1040 or MATH 1050 or MATH 1060 or MATH 1080 or MATH 2070. Students who do not meet the prerequisite, but who score a satisfactory score on the Clemson Mathematics Placement Test, or have AP or transfer credit for their math requirements, may request a registration override from the instructor. *Coreq:* CPSC 1011.

CPSC 1011 Computer Science I Laboratory 0 (2) Non-credit laboratory to accompany CPSC 1010. *Coreq:* CPSC 1010.

CPSC 1020 Computer Science II 4 (3) Continuation of CPSC 1010. Continued emphasis on problem solving and program development techniques. Examines typical numerical, nonnumerical, and data processing problems. Introduces basic data structures. Credit may not be received for both CPSC 1020 and 2100. Includes Honors sections. *Preq:* CPSC 1010 with a C or better. *Coreq:* CPSC 1021.

CPSC 1021 Computer Science II Laboratory 0 (2) Non-credit laboratory to accompany CPSC 1020. *Coreq:* CPSC 1020.

CPSC 1040 Introduction to the Concepts and Logic of Computer Programming 2 (1) Introduction to the concepts and logic of computer programming. Simple models are used to introduce basic techniques for developing a programmed solution to a given problem. Problem solving techniques are considered. Not open to students who have received credit for CPSC 1010, CPSC 1110, CPSC 1570, or CPSC 2100. *Coreq:* CPSC 1041.

CPSC 1041 Introduction to the Concepts and Logic of Computer Programming Laboratory 0 (2) Non-credit laboratory to accompany CPSC 1040. *Coreq:* CPSC 1040.

CPSC 1110 Introduction to Programming in C 3 (2) Introduction to computer programming in C and its use in solving problems. Intended primarily for technical majors. Basic instruction in programming techniques, algorithms and standard Unix software development tools and utilities. Credit may not be received for both CPSC 1010 and CPSC 1110. *Coreq:* CPSC 1111.

CPSC 1111 Introduction to Programming in C Laboratory 0 (2) Non-credit laboratory to accompany CPSC 1110. *Coreq:* CPSC 1110.

CPSC 1150 Introduction to Computational Science 3 (3) Introduction to systems thinking. Includes development of dynamical systems models using visual modeling tools and development of dynamical systems using agent based software. Class material investigates elementary science and engineering models.

CPSC 1200 Introduction to Information Technology 3 (2) Investigation of ethical and societal issues based on the expanding integration of computers into our everyday lives. Considers historical background, terminology, new technologies and the projected future of computers. Includes practical experience with common computer software technologies. Will not satisfy Computer Science Requirements in any Computer Science major. *Coreq:* CPSC 1201.

CPSC 1201 Introduction to Information Technology Laboratory 0 (2) Non-credit laboratory to accompany CPSC 1200. *Coreq:* CPSC 1200.

CPSC 1610 Introduction to Visual Basic Programming 3 (2) Introduction to programming using the Visual Basic language. Topics include simple and complex data types, arithmetic operations, control flow, files, and database programming. Several projects are implemented during the semester. *Coreq:* CPSC 1611.

CPSC 1611 Introduction to Visual Basic Programming Laboratory 0 (2) Non-credit laboratory to accompany CPSC 1610. *Coreq:* CPSC 1610.

CPSC 1990 Creative Inquiry in Computing 1-3 (1-3) Students engage in faculty-led research in the context of a team effort. May be repeated for a maximum of six credits.

CPSC 2070 Discrete Structures for Computing 3 (3) Introduces ideas and techniques from discrete structures that are widely used in the computing sciences. Topics emphasize techniques of rigorous argumentation and application to the computing disciplines. *Preq:* CPSC 1010 or CPSC 1110; and MATH 1020 or MATH 1060.

CPSC 2100 Programming Methodology 4 (3) Introduction to programming techniques and methodology. Topics include structured programming, stepwise refinement, program design and implementation techniques, modularization criteria, program testing and verification, basic data structures, and analysis of algorithms. Credit may not be received for both CPSC 1020 and 2100. *Preq:* CPSC 1110 and satisfactory performance on a pretest. *Coreq:* CPSC 2101.

CPSC 2101 Programming Methodology Laboratory 0 (2) Non-credit laboratory to accompany CPSC 2100. *Coreq:* CPSC 2100.

CPSC 2120 Algorithms and Data Structures 4 (3) Study of data structures and algorithms fundamental to computer science; abstract data-type concepts; measures of program running time and time complexity; algorithm analysis and design techniques. *Preq:* CPSC 1020 with a C or better or CPSC 2100 with a C or better. *Coreq:* CPSC 2121.

CPSC 2121 Algorithms and Data Structures Laboratory 0 (2) Non-credit laboratory to accompany CPSC 2120. *Coreq:* CPSC 2120.

CPSC 2150 Software Development Foundations 3 (2) Intensive study of software development foundations. Advanced coverage of programming language primitives, function-level design principles, and standard development and debugging tools. Introductory coverage of module-level design principles, program specification and reasoning principles, and validation and verification techniques. *Preq:* CPSC 1020 with a C or better or 2100 with a C or better. *Coreq:* CPSC 2151.

CPSC 2151 Software Development Foundations Laboratory 0 (2) Non-credit laboratory to accompany CPSC 2150. *Coreq:* CPSC 2150.

CPSC 2200 Microcomputer Applications 3 (3) Applications of microcomputers to formulate and solve problem models. Emphasizes applications development in database and spreadsheet environments. Current software products are used. Students are expected to have experience with word processing and spreadsheet applications.

CPSC 2310 Introduction to Computer Organization 4 (3) Study of the machine architectures on which algorithms are implemented and requirements of architectures that support high-level languages, programming environments, and applications. *Preq:* CPSC 1020 with a C or better or 2100 with a C or better. *Coreq:* CPSC 2311.

CPSC 2311 Introduction to Computer Organization Laboratory 0 (2) Non-credit laboratory to accompany CPSC 2310. *Coreq:* CPSC 2310.

CPSC 2810 Selected Topics in Computer Science 1-4 (1-4) Areas of computer science in which new trends arise. Innovative approaches to a variety of problems in the use and understanding of basic computing concepts are developed and implemented. May be repeated for a maximum of eight credits, but only if different topics are covered.

CPSC 2910 Seminar in Professional Issues I 1 (1) Considers the impact of computer use on society. Discusses ethical use of software and protection of intellectual property rights. Profession is viewed historically; organizations important to the profession are discussed; the development process for standards is presented; and students are introduced to the professional literature. *Preq:* CPSC 1020 or CPSC 2100.

CPSC (ECE) 3220 Introduction to Operating Systems 3 (3) Detailed study of management techniques for the control of computer hardware resources. Topics include interrupt systems, primitive level characteristics of hardware and the management of memory, processor, devices, and data. May also be offered as ECE 3220. *Preq:* CPSC 2120 and CPSC 2310, each with a C or better; or ECE 2230 and ECE 2720, each with a C or better.

- CPSC 3300 Computer Systems Organization 3 (3)** Introduction to the structure of computer systems. Various hardware/software configurations are explored and presented as integrated systems. Topics include digital logic, basic computer organization, computer arithmetic, memory organization, input/output organizations, interrupt processing, multi-processors, and cluster computers. *Preq:* CPSC 2120 and CPSC 2310, each with a C or better.
- CPSC 3500 Foundations of Computer Science 3 (3)** Development of the theoretical foundations of programming, algorithms, languages, automata, computability, complexity, data structures, and operating systems; a broad range of fundamental topics is consolidated and extended in preparation for further study. *Preq:* CPSC 2070 and CPSC 2120, each with a C or better.
- CPSC (ECE) 3520 Programming Systems 3 (3)** Second course in programming languages and systems. Topics include assemblers, compilers, and syntactical methods; string manipulation and list processing; concepts of executive programs and operating systems; introduction to time-sharing systems. May also be offered as ECE 3520. *Preq:* ECE 2230; or CPSC 2120 and CPSC 2150. *Preq or concurrent enrollment:* CPSC 2070 or MATH 4190.
- CPSC 3600 Networks and Network Programming 3 (3)** Introduction to basic concepts of computer network technologies and network programming. Topics include network programming, layered protocol architectures, local and wide area networks, internetwork and intranetwork concepts, security. Socket level programming is introduced and used throughout the course. *Preq:* CPSC 2120 and CPSC 2150, each with a C or better.
- CPSC 3620 Distributed and Cluster Computing 3 (3)** Introduction to the basic technology of and programming techniques for distributed and cluster computing. Standard techniques for developing parallel solutions to problems are introduced and implemented. Software systems that provide high-level abstractions for data communications are considered. *Preq:* CPSC 3600 with a C or better.
- CPSC 3710 Systems Analysis 3 (3)** Incorporates a study of the decision-making process at all levels with the logical design of information systems. Extensive study of the system life cycle with emphasis on current as well as classical techniques for describing data flows, data structures, file design, etc. *Preq:* CPSC 3600.
- CPSC 3720 Introduction to Software Engineering 3 (3)** Intensive introduction to software engineering. Focuses on each major phase of the software lifecycle. Introductory coverage of requirements analysis, requirements modeling, design modeling, and project management. Intermediate coverage of module-level design principles, program specification and reasoning principles, and program validation and verification techniques. *Preq:* CPSC 2120 and CPSC 2150, each with a C or better.
- CPSC 3950 Honors Seminar 1 (1)** Research topics in various areas of computer science are presented. Methods for identifying and initiating research projects are considered. May be repeated for a maximum of two credits. *Preq:* Admission to Departmental Honors Program.
- CPSC 3990 Advanced Creative Inquiry in Computing 1-3 (1-3)** Upper-division students engage in faculty-led research in the context of a team effort. May be repeated for a maximum of six credits. *Preq:* Junior standing.
- CPSC 4040 Computer Graphics Images 3 (3)** Presents the theory and practice behind the generation and manipulation of two-dimensional digital images within a computer graphics context. Image representation and storage, sampling and reconstruction, color systems, affine and general warps, enhancement and morphology, compositing, morphing, and non-photorealistic transformations. *Preq:* CPSC 2120 and MATH 3110; or DPA 4010.
- CPSC 4050* Computer Graphics 3 (3)** Computational, mathematical, physical and perceptual principles underlying the production of effective three-dimensional computer graphics imagery. *Preq:* CPSC 2120 and MATH 3110; or DPA 4010.
- CPSC 4110* Virtual Reality Systems 3 (3)** Design and implementation of software systems necessary to create virtual environments. Discusses techniques for achieving real-time, dynamic display of photorealistic, synthetic images. Includes hands-on experience with electromagnetically-tracked, head-mounted displays and requires, as a final project, the design and construction of a virtual environment. *Preq:* CPSC 2120 and 2150, both with a C or better.
- CPSC 4120* Eye Tracking Methodology and Applications 3 (3)** Introduction to the human visual system; visual perception; eye movements; eye tracking systems and applications in psychology, industrial engineering, marketing, and computer science; hands-on experience with real time, corneal-reflection eye trackers, experimental issues. Final project requires the execution and analysis of an eye tracking experiment. *Preq:* CPSC 2120 or MKT 4310 or PSYC 3100.
- CPSC 4140* Human and Computer Interaction 3 (3)** Survey of human and computer interaction, its literature, history, and techniques. Covers cognitive and social models and limitations, hardware and software interface components, design methods, support for design, and evaluation methods. *Preq:* CPSC 2120 and 2150, each with a C or better.
- CPSC 4160* 2-D Game Engine Construction 3 (3)** Introduction to tools and techniques necessary to build 2-D games. Techniques draw from subject areas such as software engineering, algorithms, and artificial intelligence. Students employ techniques such as sprite animation, parallax scrolling, sound, AI incorporated into game sprites, and the construction of a game shell. *Preq:* CPSC 2120 and 2150, each with a C or better.
- CPSC 4200* Computer Security Principles 3 (3)** Covers principles of information systems security, including security policies, cryptography, authentication, access control mechanisms, system evaluation models, auditing, and intrusion detection. Computer security system case studies are analyzed. *Preq:* CPSC 3220 or ECE 3220; and 3600, each with a C or better.
- CPSC 4240* System Administration and Security 3 (3)** Covers topics related to the administration and security of computer systems. Primary emphasis is on the administration and security of contemporary operating systems. *Preq:* CPSC 3220 or ECE 3220; and 3600, each with a C or better.
- CPSC 4280* Design and Implementation of Programming Languages 3 (3)** Overview of programming language structures and features and their implementation. Control and data structures found in various languages are studied. Also includes runtime organization and environment and implementation models. *Preq:* CPSC 2310 and 3500, each with a C or better.
- CPSC 4550* Computational Science 3 (3)** Introduction to the methods and problems of computational science. Uses problems from engineering and science to develop mathematical and computational solutions. Case studies use techniques from Grand Challenge problems. Emphasizes the use of networking, group development, and modern programming environments. *Preq:* MATH 1080 and MATH 3110. Students are expected to have previous programming experience in a higher level language.
- CPSC 4620* Database Management Systems 3 (3)** Introduction to database/data communications concepts as related to the design of online information systems. Problems involving structuring, creating, maintaining, and accessing multiple-user databases are presented and solutions developed. Comparison of several commercially available tele-processing monitor and database management systems is made. Includes Honors sections *Preq:* CPSC 2120 and CPSC 2150, each with a C or better.
- CPSC 4630* On-line Systems 3 (3)** In-depth study of the design and implementation of transaction processing systems and an introduction to basic communications concepts. A survey of commercially available software and a project using one of the systems are included. *Preq:* CPSC 4620.
- CPSC 4720* Software Development Methodology 3 (3)** Advanced topics in software development methodology. Techniques such as chief programmer teams, structured design and structured walkthroughs are discussed and used in a major project. Emphasizes the application of these techniques to large-scale software implementation projects. Also includes additional topics such as mathematical foundations of structured programming and verification techniques. Includes Honors sections. *Preq:* CPSC 3720 with a C or better.
- CPSC (ECE) 4780* General Purpose Computation on Graphical Processing Units 3 (3)** Instruction in the design and implementation of highly parallel, GPU-based solutions to computationally intensive problems from a variety of disciplines. The OpenCL language with inter-operable OpenGL components is used. Applications to models of physical systems are discussed in detail. May also be offered as ECE 4780. *Preq:* CPSC 2120 or ECE 2230.
- CPSC 4810* Selected Topics 1-3 (1-3)** Areas of computer science in which nonstandard problems arise. Innovative approaches to problem solutions which draw from a variety of support courses are developed and implemented. Emphasizes independent study and projects. May be repeated for a maximum of six credits, but only if different topics are covered. Includes Honors sections.

CPSC 4820* Special Topics in Computing 3 (3)

In-depth treatment of topics not fully covered in regular courses. Topics vary from semester to semester. May be repeated, but only if different topics are covered.

CPSC 4910 Seminar in Professional Issues II

3 (2) Considers the impact of computing system development on society. Discusses ethical issues in the design and development of computer software. Students discuss standards for professional behavior, the professional's responsibility to the profession, and techniques for maintaining currency in a dynamic field. *Preq:* Senior standing. *Coreq:* CPSC 4911.

CPSC 4911 Seminar in Professional Issues II

Laboratory 0 (2) Non-credit laboratory to accompany CPSC 4910. *Coreq:* CPSC 4910.

CPSC 4950 Senior Thesis Research (Honors) 1-3

(1-3) Directed individual research project for honors students supervised by departmental faculty. May be repeated for a maximum of six credits. *Preq:* Senior standing.

CITY AND REGIONAL PLANNING

Professors: M. Lauria, T. Schurch; *Associate Professors:* M. Cunningham, C. Dyckman, C. Ellis, *Interim Chair;* *Assistant Professor:* E. Morris; *Senior Lecturer:* S. Sperry; *Lecturer:* T. Green; *Adjunct Professor:* B. Nocks

CRP 4010* Introduction to City and Regional

Planning 3 (3) Introduces students from other disciplines to city and regional planning. Spatial and nonspatial areas of the discipline are explored through a wide ranging lecture/seminar program. *Preq:* Consent of instructor.

CRP 4030* Seminar on Planning Communication

3 (3) In-depth analysis of methods to communicate planning and policy decisions effectively. Familiarizes students with the various communication skills needed by planners, policy makers, and other professionals to become successful practitioners. *Preq:* Consent of instructor.

CRP (CE) 4120* Urban Transportation Planning

3 (3) Consideration of urban travel characteristics, characteristics of transportation systems, transportation and land-use studies, trip distribution and trip assignment models, city patterns and subdivision layout. May also be offered as CE 4120. *Preq:* CE 3110.

CRP 4300* The Nature of Geographic Information

Systems (GIS) 3 (2) Introduction to the theory and practical use of Geographic Information Systems (GIS). The course emphasizes geographic and statistical information and how it is represented and analyzed with computers. It introduces the concepts and components of a GIS and how they affect societal issues. *Coreq:* CRP 4301.

CRP 4301* The Nature of Geographic Information

Systems (GIS) Laboratory 0 (3) Non-credit laboratory to accompany CRP 4300. *Coreq:* CRP 4300.

CONSTRUCTION SCIENCE AND MANAGEMENT

Professors: D.C. Bausman, S. N. Clarke, R.W. Liska, C.A. Piper; *Assistant Professors:* J.M. Burgett, J.D. Lucas, J.P. Smith; *Senior Lecturer:* J.A. Wintz

CSM 1000 Introduction to Construction Science

and Management 3 (3) Introduction to the construction industry and the Construction Science and Management Department. *Preq:* Construction Science and Management major.

CSM 1500 Construction Problem Solving 3 (3)

Fundamentals and application of formal problem solving, critical thinking and ethics. *Preq:* CSM 1000 and Construction Science and Management major.

CSM 2010 Structures I 3 (3)

Study of statically determinate structural components and systems, including force applications and distributions in structural elements and the resulting stress-strain patterns in axial, shear, and bearing mechanisms. *Preq:* MATH 1020 or MATH 1060; and PHYS 2070 and PHYS 2090; and Construction Science and Management or Architecture major.

CSM 2020 Structures II 4 (3)

Study of force distribution and behavior in statically determinate structural components and systems; analysis and design of basic reinforced concrete, steel, wood, and formwork components and systems, including shear and moment stress, combined loading/stress conditions, and deflections. *Preq:* CSM 2010; and Construction Science and Management or Architecture major. *Coreq:* CSM 2021.

CSM 2021 Structures II Laboratory 0 (2)

Non-credit laboratory to accompany CSM 2020. *Coreq:* CSM 2020.

CSM 2030 Materials and Methods of Construction I

3 (3) Descriptive study of the materials and methods of construction, focusing on nomenclature, building materials, and assembly of building systems consisting primarily of wood, masonry, residential interior and exterior finishes, and building foundations. *Preq:* Construction Science and Management or Architecture major. *Preq or concurrent enrollment:* ART 2100 and CSM 1000 (Architecture majors do not need the preq courses, but must request a registration override from the instructor).

CSM 2040 Contract Documents 3 (2)

Introduction to working drawings, specifications, and the various documents required to carry out a typical construction project. *Preq:* Construction Science and Management major, or consent of department chair. *Coreq:* CSM 2041 and CSM 2050.

CSM 2041 Contract Documents Laboratory 0 (3)

Non-credit laboratory to accompany CSM 2040. *Coreq:* CSM 2040.

CSM 2050 Materials and Methods of Construction

II 3 (3) Descriptive study of materials and methods of construction, focusing on nomenclature, building materials, and assembly of building systems consisting primarily of steel and concrete, in addition to roofing assemblies and interior and exterior commercial finishes. *Preq:* CSM 2030; and Construction Science and Management or Architecture major. *Coreq:* CSM 2040.

CSM 3030 Soils and Foundations 3 (2)

Study of various types of soils and foundations, including soil testing, reports, compaction, stability, and function, as they relate to the construction process. *Preq:* CSM 2020, and Construction Science and Management major. *Coreq:* CSM 3031.

CSM 3031 Soils and Foundations Laboratory 0 (3)

Non-credit laboratory to accompany CSM 3030. *Coreq:* CSM 3030.

CSM 3040 Environmental Systems I 3 (3)

Theory and practice of heating, ventilating, air conditioning, and plumbing systems for buildings. *Preq:* CSM 2050 and PHYS 2080 and PHYS 2100, and Construction Science and Management or Architecture major.

CSM 3050 Environmental Systems II 3 (3)

Theory and practice of fire protection, specialty piping, lighting, and electrical systems for buildings. *Preq:* CSM 3040 and Construction Science and Management or Architecture major.

CSM 3510 Construction Estimating 3 (2)

Study of basic estimating as applied to construction projects. Includes the take-off of material quantities, assigning labor and equipment production rates, and applying material prices, wage rates, and equipment costs to derive a total job cost. *Preq:* CSM 2040 and CSM 2050 and MGT 2180, all required MATH courses, Construction Science and Management major. *Preq or concurrent enrollment:* AGM 2210 and CSM 3030. *Coreq:* CSM 3511.

CSM 3511 Construction Estimating Laboratory

0 (2) Non-credit laboratory to accompany CSM 3510. *Coreq:* CSM 3510.

CSM 3520 Construction Scheduling 3 (2)

Analysis of construction projects emphasizing estimating, scheduling, and resource leveling. *Preq:* CSM 3510, Construction Science and Management major. *Preq or concurrent enrollment:* CSM 3040. *Coreq:* CSM 3521 and CSM 3530.

CSM 3521 Construction Scheduling Laboratory 0

(2) Non-credit laboratory to accompany CSM 3520. *Coreq:* CSM 3520.

CSM 3530 Construction Estimating II 3 (2)

Continuation of basic construction estimating with the additional component of computerized estimating. Includes material, labor, and equipment costs, production rates, bid ethics, constructability analysis, and understanding of other types of estimating procedures. *Preq:* CSM 3510 and Construction Science and Management major. *Preq or concurrent enrollment:* CSM 3040. *Coreq:* CSM 3520 and CSM 3531.

CSM 3531 Construction Estimating II Laboratory

0 (2) Non-credit laboratory to accompany CSM 3530. *Coreq:* CSM 3530.

CSM 4110 Safety in Building Construction 3 (3)

Study of construction safety management and controls. *Preq:* Construction Science and Management major. *Coreq:* CSM 4530.

CSM 4200 Highway Construction and Contracting

3 (3) Study of contracting and construction of highways, including selection and use of equipment, construction of pavements, bridges, and drainage structures, and related processes. *Preq:* CSM 3030 and CSM 3520 and CSM 3530.

CSM 4500 Construction Internship 1 (1)
Documentation of 8000 hours of approved experience in the construction industry with evaluation of student portfolio and preparation and sitting for the American Institute of Constructors CPC Level I examination. *Preq:* Consent of department chair.

CSM 4530 Construction Project Management 3 (3) Study of construction business organization, methods of project delivery, field organization, policy, ethics, project management, control systems, labor management relations, and productivity. *Preq:* CSM 3520 and CSM 3530, and Construction Science and Management major. *Preq or concurrent enrollment:* LAW 3220 and MGT 3070. *Coreq:* CSM 4110 and CSM 4610.

CSM 4540 Construction Capstone 6 (5) Students develop a capstone project that entails the knowledge obtained in all previous courses in the Construction Science and Management Program. Students must take the capstone course at Clemson University. *Preq:* CSM 4530 and Construction Science and Management major. *Coreq:* CSM 4541.

CSM 4541 Construction Capstone Laboratory 0 (3) Non-credit laboratory to accompany CSM 4540. *Coreq:* CSM 4540.

CSM 4550* Reducing Adversarial Relations in Construction 3 (3) Focuses on the study of the delivery of projects and how adversarial relations can affect the successful completion of the venture. Topics include management of human resources, understanding the needs and processes of the participants, where problems lie, methods of avoiding and settling disputes. *Preq:* Construction Science and Management or Architecture major, and senior standing.

CSM 4610 Construction Economics Seminar 3 (3) Studies in the financial performance of construction companies. *Preq:* ACCT 2010 and ECON 2110 and ECON 2120, and Construction Science and Management major. *Coreq:* CSM 4530.

CSM 4900 Directed Studies 1-3 (1-3) Comprehensive studies and research of special topics not covered in other courses. Emphasizes field studies, research activities, and current developments in construction science. May be repeated for a maximum of six credits. Includes Honors sections. *Preq:* Consent of instructor.

CSM 4980 Current Topics in Construction 1-3 (1-3) Study of current topics in the construction industry not central to other construction science courses. Specific titles and course descriptions are announced for each semester. May be repeated for a maximum of six credits. *Preq:* Consent of department chair.

CAREER AND TECHNOLOGY EDUCATION

CTE 1150 Contemporary Technological Problems 3 (3) Provides students with an understanding of the problems and contributions of technology. Examples are taken from historical accounts and from analyses of contemporary technological intervention both in industrialized and nonindustrialized countries.

CTE 2210 Exploring Technology 3 (3) Covers a wide range of technological concepts along with familiar examples of how technology impacts our lives as individuals, a society, and a global community.

CTE 3100 Designing Creative Instruction 3 (2) Provides preservice teachers with opportunities to develop skills in technological literacy, design, inquiry-based instruction, and problem solving using a variety of media, with emphasis on their applications in the elementary curriculum. *Preq:* Junior standing in Early Childhood or Elementary Education. *Coreq:* CTE 3101.

CTE 3101 Designing Creative Instruction Laboratory 0 (2) Non-credit laboratory to accompany CTE 3100. *Coreq:* CTE 3100.

CLEMSON UNIVERSITY

CU 1000 Clemson Connect 0 (0) Introduction to the learning experience at Clemson University. Includes instruction in information technology and information skills. To be taken Pass/No Pass only.

CU 1010 University Success Skills 2 (3) Introduction to a variety of topics critical to students' success. Topics include time management, goal setting, test taking, campus resources and policies, critical thinking, and diversity. Students are given opportunities to discover and practice many procedures, techniques, and tips. Limited to freshmen and first semester transfer students.

CU 1100 Introduction to Tutoring 1 (1) Students develop and reinforce skills in tutoring and communication through use of techniques based in educational research. To be taken Pass/No Pass only.

CU 1110 Introduction to Supplemental Instruction 1 (1) Students develop and reinforce interpersonal relationship skills in listening, decision making, communicating, group dynamics, leadership, assertiveness, time management, problem solving, and conflict resolution. To be taken Pass/No Pass only.

CU 1200 Introduction to Career Development 1 (1) This course educates students about career planning, equips them to evaluate prospective career fields, and enables them to pursue career aspirations. Upon completion, students have a greater awareness of their career interests, and understand the connection between their studies and their career goals.

CU 1400 The Entrepreneurial Mindset 2 (2) This course introduces the thought processes and entrepreneurial methods by which big problems in business, industry and society can be solved. It introduces skills in critical and integrative thinking and strategic problem solving. After essential concepts and frameworks are presented, students are introduced to problem-solving techniques. The latter part of the course provides occasion for students to practice these skills through a small team project.

CU 1410 Creativity, Innovation and Entrepreneurship 3 (3) This course introduces creativity and innovation thinking skills and processes critical in the generation of entrepreneurial teams and opportunities. These include the concepts of observation, problem identification, lateral thinking, design thinking, brainstorming, interdisciplinary teams, problem solving, and generation of a value proposition. Best practices of entrepreneurship are introduced and these skills are then applied towards the identification of an early stage entrepreneurial opportunity. *Preq:* CU 1400.

CU 1970 New Student Seminar 1-3 (1-3) Introduction to the university academic environment. Class meeting instruction focuses on discussion of a topic selected by a faculty member. Includes additional online and workshop instruction in information technology, global citizenship and academic success skills. To be taken Pass/No Pass only.

CU 2010 Sustainability Leadership 3 (3) Participants learn how principles of environmental, social and economic sustainability apply in contexts ranging from personal lifestyle choices, to the built environment, to operation of public and private institutions. Participants also develop and practice skills to act as agents of change in the university and the broader community.

CARDIOVASCULAR TECHNOLOGY

Lecturer: E.J. Walker

CVT 2250 Ultrasound Physics 3 (3) Explanation of the basic principles and characteristics associated with diagnostic ultrasound. *Preq:* CVT 2260.

CVT 2260 Introduction to Cardiovascular Sonography 3 (3) Introduces students to patient care, patient confidentiality, blood components, lymphatics, cardiovascular pharmacology, heart embryology, cardiovascular anatomy and physiology, standard sonography views, and Doppler/instrumentation. *Preq or concurrent enrollment:* BIOL 2220.

CVT 3250 Echocardiography Principles 4 (3) Study of two-dimensional, m-mode, Doppler echocardiography and left ventricular systolic function. Includes discussion of various pathologies, the resulting echocardiographic findings and treatments. *Preq:* CVT 2250 and CVT 2260. *Coreq:* CVT 3251.

CVT 3251 Echocardiography Principles Laboratory 0 (2) Non-credit laboratory to accompany CVT 3250. *Coreq:* CVT 3250.

CVT 3260 Echocardiography Methods 4 (3) Study of two-dimensional, Doppler echocardiography and transesophageal echocardiography. Includes discussion of various pathologies, the resulting echocardiographic findings and treatments. *Preq:* CVT 3250. *Coreq:* CVT 3261.

CVT 3261 Echocardiography Methods Laboratory 0 (2) Non-credit laboratory to accompany CVT 3260. *Coreq:* CVT 3260.

CVT 3350 Vascular Sonography Principles 4 (3) Study of two-dimensional, color Doppler, spectral Doppler and other testing modalities in peripheral and cerebrovascular disease. Includes discussion of various pathologies, the resulting sonographic findings and treatments. *Preq:* CVT 2260. *Coreq:* CVT 3351.

CVT 3351 Vascular Sonography Principles Laboratory 0 (2) Non-credit laboratory to accompany CVT 3350. *Coreq:* CVT 3350.

CVT 3360 Vascular Sonography Methods 4 (3) Study of two-dimensional, color Doppler, spectral Doppler and other testing modalities in peripheral arterial, abdominal vascular and intracranial cerebrovascular disease. Includes discussion of various pathologies, the resulting sonographic findings and treatments. *Preq:* CVT 3350. *Coreq:* CVT 3361.

CVT 3361 Vascular Sonography Methods Laboratory 0 (2) Non-credit laboratory to accompany CVT 3360. *Coreq:* CVT 3360.

CVT 4240 CVS Field Experience I 3 (18) Students complete 4400 hours of uninterrupted, supervised work in a clinical care setting. Under direct supervision of GHS registered sonographers, students are introduced to scanning protocols and techniques, instructed in principles, techniques and applications of multiple diagnostic modalities, including echocardiography, vascular duplex imaging, Doppler, and plethysmography. *Preq:* CVT 3260 and 3360.

CVT 4250 CVS Field Experience II 6 (18) Intermediate level course expands on introductory skills learned in CVT 4240. Students apply scanning protocols and techniques, and improve their use of multiple diagnostic modalities, including echocardiography, vascular duplex imaging, Doppler, and plethysmography. Students become proficient with all aspects of paperwork and communications within the health care organization. *Preq:* CVT 4240.

CVT 4260 CVS Field Experience III 6 (18) In this advanced course, students complete 440 hours in a clinical setting under the supervision of registered sonographers. Students are tested in all aspects of fundamental principles, techniques and applications of multiple diagnostic modalities, including echocardiography, vascular duplex imaging, Doppler and plethysmography. *Preq:* CVT 4250.

DANCE

Lecturer: C.L. Hosler

DANC 1300 Tap Dance I 1 (3) Introduces fundamentals and vocabulary of tap dancing with opportunities to develop rhythmic patterns of various origins. Applied dance fee is assessed.

DANC 1400 Jazz Dance I 1 (3) Introduces basic principles and fundamentals of jazz technique and explores flexibility and strength-building exercises. Applied dance fee is assessed.

DANC 1500 Modern Dance I 1 (3) Introduces basic principles of dance movement and vocabulary, and actively explores and applies different methods of body alignment and theory. Applied dance fee is assessed.

DANC 1600 Ballet Dance I 1 (3) Introduces basic principles and fundamentals of classical ballet, with emphasis on good technique, center work, and across the floor work. Applied dance fee is assessed.

DANC 3300 University Dance Company 1 (3) Performance ensemble for advanced dance students. Provides opportunities to learn and develop choreographic skills as well as to improve personal dance techniques. Company is selected by audition. May include public recital(s). May be repeated for a maximum of 24 credits. Applied dance fee is assessed.

DIGITAL PRODUCTION ARTS

Professors: A.T. Duchowski, R.M. Geist III, D.H. House, J.A. Tessoroff, *Director;* *Associate Professors:* T.A. Davis, D.S. Donar, B.A. Malloy, A.M. Penna; *Assistant Professors:* S. Joerg, J. Levine; *Lecturer:* L.J. House

DPA 3070 Studio Methods for Digital Production 3 (1) Exposes students to current studio practice in the development of 3-D computer graphics and animation for film, electronic games, and visualization. Topics include modeling, rigging, animation, texturing, lighting, rendering, compositing and editing. Open source tools are used so methods are transportable to most computing environments. *Coreq:* DPA 3071.

DPA 3071 Studio Methods for Digital Production Laboratory 0 (4) Non-credit laboratory to accompany DPA 3070. *Coreq:* DPA 3070.

DPA 4000* Technical Foundations of Digital Production I 3 (3) The technical, conceptual, and algorithmic foundations of computer graphics. Covers the Unix operating system, scripting, C programming, and an interactive graphics API. Not open to Computer Engineering, Computer Information Systems or Computer Science majors.

DPA 4010* Technical Foundations of Digital Production II 3 (3) The mathematical and algorithmic foundations of computer graphics. Covers spatial data structures, object oriented programming in C++, mathematics for graphics, and 3-D graphics API. *Preq:* DPA 4000. Not open to Computer Science, Computer Engineering, or Computer Information Systems majors.

DPA 4020* Visual Foundations of Digital Production I 3 (6) Presents the visual foundations underlying computer graphics production. Covers perspective, observational drawing, color and value, principles of composition and design, and storyboarding. Incorporates the studio method, involves students in hands-on work and the critique process, and stresses examples from the history of art, animation and film. Not open to Architecture or Visual Arts majors.

DPA 4030* Visual Foundations of Digital Production II 3 (6) Extends the foundational visual principles underlying computer graphics production begun in DPA 4020. Stresses representation of the figure in drawing and the use of cameras. Incorporates the studio method and the critique process, and stresses examples from the history of art, animation and film. *Preq:* DPA 4020. Not open to Architecture or Visual Arts majors.

DESIGN STUDIES

Professors: D.J. Allison, J.F. Barker, *President Emeriti;* K.E. Green, R.J. Hogan, *Associate Chair;* K.L. Schwennsen, *Chair;* S.F. Verderber; *Associate Professors:* D.G. Battisto, D.N. Harding, D.A. Hecker, R.T. Silance; *Assistant Professors:* D.G. Albright, C.R. Barrios Hernandez, V.Y. Blouin, U. Ersoy, S.R. Hambright-Belue, U. Heine, R.T. Huff (*Charleston*), P.L. Laurence, D.M. Lee, A.E. Montilla, M.L. Skinner; *Senior Lecturers:* R.A. Bruhns, A.H. Jacques, C.B. Mills; *Lecturers:* N. W. Ault, J.B. Garland, P.W. Head (*Charleston*), A.K. Jennings (*Charleston*), J.A. Lindsey (*Charleston*), D.A. Pastre (*Charleston*), J.G. Thomas (*Charleston*)

DSGN 3700 Design Principles 6 (1) Students develop graphic skills, including plans, sections, elevations, axonometric and perspective drawings, and develop creative problem solving skills incorporating precedent studies, contextual analysis, concept development, modeling and presentation skills. Course is offered only during the summer at study abroad locations. *Preq:* ARCH 1010. *Coreq:* DSGN 3701.

DSGN 3701 Design Principles Laboratory 0 (10) Non-credit laboratory to accompany DSGN 3700. *Coreq:* DSGN 3700.

EAST ASIAN STUDIES

EAS 1110 Introduction to Chinese Language and Culture 3 (3) Introductory course for beginners to Chinese language skills and cultural aspects. Topics are selected for learners to interact and communicate addressing everyday situations. The course may not be used as a substitute for any other CHIN course.

EAS 1120 Introduction to Japanese Language and Culture 3 (3) Introductory course for beginners to Japanese language skills and cultural aspects. Topics are selected for learners to interact and communicate addressing everyday situations. The course may not be used as a substitute for any other JAPN course.

EAS 1230 Introduction to China 3 (3) Introduction to various aspects of Chinese civilization, including geography, ethnic groups, language, history, philosophy, religion, literature, arts, architecture, and social customs. All readings and discussions are in English.

ELECTRICAL AND COMPUTER ENGINEERING

Professors: R.R. Brooks, E.R. Collins Jr., K.A. Corzine, J.N. Gowdy, T.H. Hubing, E.G. Johnson, G. Koley, E.B. Makram, D.L. Noneaker, M.B. Pursley, R.J. Schalkoff, R. Singh, G.K. Venayagamoorthy, I.D. Walker, H. Xiao; *Associate Professors:* C.W. Baum, L. Dong, R.E. Groff, W.R. Harrell, A.W. Hoover, W.B. Ligon III, A.Q. Martin, H.B. Russell, H. Shen, M.C. Smith, K.-C. Wang, P. Wang, L. Zhu; *Assistant Professor:* Y.Q. Wang; *Visiting Associate Professors:* S.J. Hubbard, W.J. Reid III; *Visiting Assistant Professor:* A. Kapadia

ECE 1010 Robots in Business and Society 3 (3)

Explores the significant role that robotics and automation play in society. Students gain an appreciation of the ethics, economics, psychology, politics and technologies that must be considered in the use of robots. Includes hands-on exercises using Legos to explore robot construction and intelligence. Open only to non-engineering majors.

ECE 1990 Creative Inquiry—Electrical and Computer Engineering 1-4 (1-4)

In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.

ECE 2010 Logic and Computing Devices 2 (2)

Introduction to Boolean algebra and digital logic. Topics include number systems and representation of information; Boolean operators and algebra; expression minimization; combinational circuits, including adders, comparators, decoders and multiplexors; sequential logic, including flip-flops, shift registers, counters and memory. Includes Honors sections. *Preq:* MATH 1080 and PHYS 1220, each with a C or better.

ECE 2020 Electric Circuits I 3 (3)

Study of DC resistive circuits, Kirchhoff's Laws, Nodal and Mesh emphasis, sources, Thevenin's and Norton's theorems, RC, RL, RCL circuit solutions with initial condition using homogenous or nonhomogenous ordinary differential equations having constant coefficients. Develop sinusoidal steady state solution. Includes Honors sections. *Preq:* MATH 1080 and PHYS 1220, each with a C or better. *Preq or concurrent enrollment:* PHYS 2210 with a C or better.

ECE 2040 Circuit Analysis Problems I 1 (3)

Analysis and solution of electrical network problems using mesh and nodal analysis, Thevenin's and Norton's theorems and equivalent circuits and other circuit analysis from ECE 2020. *Preq or concurrent enrollment:* ECE 2020 with a C or better.

ECE 2070 Basic Electrical Engineering 2 (2)

A first course in electrical engineering to provide non-Electrical Engineering majors with a knowledge of DC and AC circuit theory, AC power distribution, and numerous electrical devices, apparatus, and digital systems. Credit may not be received for both ECE 2070 and ECE 3080. *Preq:* MATH 2060 and PHYS 2210.

ECE 2080 Electrical Engineering Laboratory I

1 (2) Laboratory to accompany ECE 2070. Basic electrical circuits and instrumentation. *Preq or concurrent enrollment:* ECE 2070.

ECE 2090 Logic and Computing Devices Laboratory

1 (2) Introduction to designing, building, simulating and testing digital logic circuits. Topics include SSI and MSI ICs; general combinational circuits; adders, decoders and multiplexors; general sequential circuits; shift registers, counters and memory. Includes Honors sections. *Preq or concurrent enrollment:* ECE 2010 with a C or better.

ECE 2110 Electrical Engineering Laboratory I

1 (2) Principles of measurement and instruments used to measure parameters and dynamic variables in electric circuits, steady state and transient measurements in DC and AC circuits, and data analysis methods are included. *Preq or concurrent enrollment:* ECE 2020 with a C or better.

ECE 2120 Electrical Engineering Laboratory II

1 (2) Emphasizes measurement techniques in AC steady-state circuits and comparison to theoretical predictions. Two-port network methodology and transfer functions are studied experimentally and related to analysis using transform techniques. *Preq:* ECE 2020 and ECE 2110, each with a C or better. *Preq or concurrent enrollment:* ECE 2620 with a C or better.

ECE 2220 Systems Programming Concepts for Computer Engineering 3 (3)

Development of computer systems programming and code reading techniques. Tools, programming languages, libraries, operating systems, and hardware. Code reading is emphasized. Programming projects reinforce course topics. *Preq:* CPSC 1110 with a C or better.

ECE 2230 Computer Systems Engineering 3 (3)

Analysis of implementation techniques for systems software. Applying engineering principles including code reading to the design of data structures and algorithms for low level computer systems, embedded systems, and hardware/software systems. Includes coverage of address translation, memory management, file systems, and process management. *Preq:* ECE 2220 with a C or better.

ECE 2620 Electric Circuits II 3 (3)

Continuation of the study of electric circuits, including three-phase circuits, complex frequency and network functions, frequency response, two-port parameters, magnetically-coupled circuits, Laplace transforms, and introduction to Fourier series and transforms. Includes Honors sections. *Preq:* ECE 2020 and MATH 2060 and PHYS 2210, each with a C or better. *Preq or concurrent enrollment:* MATH 2080 with a C or better.

ECE 2630 Circuit Analysis Problems II 1 (3)

Analysis of basic AC circuit analysis techniques to analyze the transient and steady-state behavior of both simple and complex circuits. *Preq or concurrent enrollment:* ECE 2620 and MATH 2080, each with a C or better.

ECE 2720 Computer Organization 3 (3)

Introductory course in computer organization and architecture. Topics include CPUs, memory, I/O, processor families, buses, peripherals, microarchitectures, and instruction sets. Includes Honors sections. *Preq:* ECE 2010 and CPSC 1110, each with a C or better.

ECE 2730 Computer Organization Laboratory

1 (2) Laboratory enhances students' understanding of computer organization via assignments involving assembly language programming. Topics include basic syntax, branching and loops, addressing modes, arrays and pointers, subroutines and stacks. Includes Honors sections. *Preq or concurrent enrollment:* ECE 2720 with a C or better.

ECE 2990 Creative Inquiry—Electrical and Computer Engineering 1-4 (1-4)

In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Includes Honors sections. *Preq:* Consent of faculty member/mentor.

ECE 3000 Junior Honors Seminar 1 (2)

Acquaints students enrolled in the Departmental Honors Program with current research activities in the Department. Faculty provide seminars where research interests are summarized. Seminars are planned to prepare students in choosing research topics for their senior theses.

ECE 3080 Fundamentals of Electrical Engineering

3 (3) A first course in electrical engineering to provide non-Electrical Engineering majors with a knowledge DC and AC circuit theory, AC power distribution, numerous electrical devices, digital systems, instrumentation and measurement systems, electronics, electromechanics, and electric motors. Credit may not be received for both ECE 2070 and 3080. *Preq:* MATH 2060 and PHYS 2210.

ECE 3110 Electrical Engineering Laboratory III

1 (2) Measurements and characteristics of electronic devices and circuits; use of manual and automated instruments to acquire data; oral and written engineering reports. *Preq:* ECE 2120 and ECE 2620 and MATH 2080 and PHYS 2210, each with a C or better. *Preq or concurrent enrollment:* ECE 3200 with a C or better.

ECE 3120 Electrical Engineering Laboratory IV

1 (2) Design and characterization of functional circuits using solid-state devices; use of manual and automated instruments for measurements; statistical analysis of data; preparation of engineering reports. *Preq:* ECE 3110 and ECE 3200, each with a C or better. *Preq or concurrent enrollment:* ECE 3210 with a C or better.

ECE 3170 Random Signal Analysis 3 (3)

Introduction to engineering problems of a probabilistic nature. Systems transformations, statistical averages, simulation, and estimation of system parameters. Includes Honors sections. *Preq:* ECE 2620 and MATH 2080, each with a C or better. *Preq or concurrent enrollment:* ECE 3300 with a C or better.

ECE 3200 Electronics I 3 (3)

Introduction to electronic materials and devices; principles of design; design of DC and AC circuits using diodes, bipolar junction transistors, field-effect transistors and use of transistors in digital circuits. Includes Honors sections. *Preq:* ECE 2620 and MATH 2080 and PHYS 2210, each with a C or better.

ECE 3210 Electronics II 3 (3)

Analysis and design of discrete amplifier circuits at low and high frequencies; operational amplifiers, distortion in amplifiers, oscillator design, and circuit analysis of active digital devices. *Preq:* ECE 3200 with a C or better.

- ECE (CPSC) 3220 Introduction to Operating Systems 3 (3)** Detailed study of management techniques for the control of computer hardware resources. Topics include interrupt systems, primitive level characteristics of hardware and the management of memory, processor, devices, and data. May also be offered as CPSC 3220. *Preq:* CPSC 2120 and CPSC 2310, each with a C or better; or ECE 2230 and ECE 2720, each with a C or better.
- ECE 3270 Digital Computer Design 3 (3)** Design of high-speed ALUs, control and timing circuitry, memory systems and I/O circuitry; microprogrammed computer design using bit-slice microprocessors; current hardware topics related to computer design; hands-on design experience; and use of logic analyzer for system debugging. *Preq:* ECE 3710 with a C or better.
- ECE 3290 Computer Systems Structures 3 (3)** Fundamental structures and issues that arise in the analysis and implementation of computer systems. Topics include operating systems structures and data structures and their relationship to computer organization. Engineering science background for computer systems design. *Preq:* ECE 2230 and ECE 2720, each with a C or better.
- ECE 3300 Signals, Systems, and Transforms 3 (3)** Study of systems models, analysis of signals, Fourier series and transforms, sampling and Z transforms, discrete Fourier transforms. Includes Honors sections. *Preq:* ECE 2620 and MATH 2080, each with a C or better.
- ECE (CPSC) 3520 Programming Systems 3 (3)** Second course in programming languages and systems. Topics include assemblers, compilers, and syntactical methods; string manipulation and list processing; concepts of executive programs and operating systems; introduction to time-sharing systems. May also be offered as CPSC 3520. *Preq:* ECE 2230; or CPSC 2120 and CPSC 2150, each with a C or better. *Preq or concurrent enrollment:* CPSC 2070 or MATH 4190, each with a C or better.
- ECE 3600 Electric Power Engineering 3 (3)** Presents the basic principles of electromagnetic induction and electromagnetic forces developed. Topics include synchronous machines, power transformers, electric power transmission, and distribution systems, DC motors, and induction motors. *Preq:* ECE 2620 and PHYS 2210, each with a C or better.
- ECE 3710 Microcontroller Interfacing 3 (3)** Discusses the programming and interfacing of microcontrollers in order to control their integrated devices and external peripherals. Topics include memory and I/O; interrupts, counters and timers; ADCs and DACs; PWMs; and parallel and serial communication. *Preq:* ECE 2620 and ECE 2720, each with a C or better. *Preq or concurrent enrollment:* ECE 3200 with a C or better.
- ECE 3720 Microcontroller Interfacing Laboratory 1 (3)** Discusses the programming and interfacing of microcontrollers in order to control their integrated devices and external peripherals. Topics include memory and I/O; interrupts, counters and timers; ADCs and DACs; PWMs; and parallel and serial communication. *Preq or concurrent enrollment:* ECE 3710 with a C or better.
- ECE 3800 Electromagnetics 3 (3)** Introduction to electric fields and potentials, dielectrics, capacitance, resistance, magnetic field, forces, work and energy, inductance, time-varying fields, and Maxwell's equations. *Preq:* ECE 2620 and MATH 2060 and PHYS 2210, each with a C or better.
- ECE 3810 Fields, Waves, and Circuits 3 (3)** Covers foundation of circuit theory, transmission lines and circuits, plane-wave propagation, fiber optics, radiation and antennas, and coupled circuits. *Preq:* ECE 3800 and MATH 2080, each with a C or better.
- ECE 3990 Creative Inquiry—Electrical and Computer Engineering 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Includes Honors sections. *Preq:* Consent of faculty member/mentor.
- ECE 4040* Semiconductor Devices 3 (3)** Consideration of the principles of operation, external characteristics, and applications of some of the more important semiconductor devices presently available. *Preq:* ECE 3200 with a C or better. *Preq or concurrent enrollment:* MATH 3110 or MATH 4340, each with a C or better.
- ECE 4050 Design Projects in Electrical and Computer Engineering 1-3 (1-3)** Individually defined projects oriented toward providing experience in establishment of objectives and criteria, synthesis, analysis, construction, testing, and evaluation. Develops student creativity through the solution of open-ended problems. Includes individual instruction in design methodology. May be repeated for a maximum of three credits. *Preq:* ECE 3300 or ECE 4090, each with a C or better; and consent of project supervisor.
- ECE 4060* Introduction to Microelectronics Processing 3 (3)** Microelectronic processing, MOS and bipolar monolithic circuit fabrication, thick and thin film hybrid fabrication, applications to linear and digital circuits, fundamentals of device design. *Preq:* ECE 3200 with a C or better. *Preq or concurrent enrollment:* MATH 3110 or MATH 4340, each with a C or better.
- ECE 4090 Continuous and Discrete Systems Design 3 (3)** Introduction to classical linear control systems. Topics include continuous and discrete descriptions of systems, time and frequency response, stability, system specification, system design of continuous and discrete systems. *Preq:* ECE 3300 with a C or better.
- ECE 4120 Electrical Machines Laboratory 1 (2)** Selected experiments to familiarize students with characteristics of transformers, DC and AC motors and generators. Measurement techniques and component modeling are included. *Preq or concurrent enrollment:* MATH 4340 with a C or better; and ECE 3600 or ECE 4190, each with a C or better.
- ECE 4170* Elements of Software Engineering 3 (3)** Foundations of software design, reasoning about software, the calculus of programs, survey of formal specification techniques and design languages. *Preq:* ECE 3220 and ECE 3520 and MATH 4190, each with a C or better.
- ECE 4180* Power System Analysis 3 (3)** Study of power system planning and operational problems. Topics include load flow, economic dispatch, fault studies, transient stability, and control of problems. System modeling and computer solutions are emphasized through class projects. *Preq:* ECE 3600 and ECE 3800, each with a C or better.
- ECE 4190* Electric Machines and Drives 3 (3)** Performance, characteristics, and modeling of AC and DC machines during steady-state and transient conditions. Introduction to power electronics devices and their use in adjustable speed motor drives. *Preq:* ECE 3210 and ECE 3600 and ECE 3800, each with a C or better. *Preq or concurrent enrollment:* MATH 4340 with a C or better.
- ECE 4200* Renewable Energy Penetration on the Power Grid 3 (3)** Introduces the basic definition of electrical power, interfacing primary sources, generator/load characteristics, and renewable energy resources. Topics include solar energy grid interfacing, wind energy grid interfacing, battery charging/management, harmonic distortion, voltage sags, and national standards. *Preq:* ECE 2070 or ECE 3200, each with a C or better.
- ECE 4220* Electronic System Design I 3 (2)** Emphasizes the application of theory and skills to the design, building, and testing of an electronic system with both analog and digital components. Application varies each semester. Computer software tools are used extensively in the design process. *Preq:* ECE 3210 and ECE 3300 and ECE 3600 and ECE 3710 and ECE 3810, each with a C or better. *Coreq:* ECE 4221.
- ECE 4221* Electronic System Design I Laboratory 0 (2)** Non-credit laboratory to accompany ECE 4220. *Coreq:* ECE 4220.
- ECE 4270 Communications Systems 3 (3)** Study of communication systems design and analysis. Topics include signals and spectra, baseband signaling and detection in noise, digital and analog modulation and demodulation techniques, communications link budget analysis. *Preq:* ECE 3170 and ECE 3300, each with a C or better.
- ECE 4290* Organization of Computers 3 (3)** Computer organization and architecture. Topics include a review of logic circuits, bus structures, memory organization, interrupt structures, arithmetic units, input-output structures, state generation, central processor organization, control function implementation, and data communication. Registered Transfer Language (RTL) for description and design of digital systems. *Preq:* ECE 2720 with a C or better.
- ECE 4300* Digital Communications 3 (3)** Introduction to modern digital communication systems, emphasizing modulation and detection, taking into account the effects of noise. Includes Honors sections. *Preq:* ECE 3170 and ECE 3300, each with a C or better; and consent of instructor. Consent is not required for honors students.

- ECE 4320* Instrumentation 3 (3)** Theory and analysis of transducers and related circuits and instrumentation. Generalized configurations and performance characteristics of instruments are considered. Transducer devices for measuring physical parameters such as motion, force, torque, pressure, flow, and temperature are discussed. *Preq:* ECE 3210 with a C or better. *Preq or concurrent enrollment:* MATH 3110 or MATH 4340, each with a C or better.
- ECE 4350* Grounding and Shielding 3 (3)** Introduction to electromagnetic compatibility concepts and techniques for students who will be designing or working with electronic systems when they graduate. Topics include electromagnetic interference and noise control, crosstalk and signal integrity, grounding, filtering, shielding, circuit board layout, lighting and electrostatic discharge protection. *Preq:* ECE 3810 with a C or better.
- ECE 4360* Microwave Circuits 3 (3)** Analysis of microwave networks comprising transmission lines, waveguides, passive elements, interconnects, and active solid state microwave circuits. Use of modern CAD tools to design RF/Microwave passive/active networks. Fabrication of typical circuits. *Preq:* ECE 3810 with a C or better. *Preq or concurrent enrollment:* MATH 3110 or MATH 4340, each with a C or better.
- ECE 4370* Microelectromechanical Systems 3 (3)** Introduction to the basic materials in current microelectromechanical systems (MEMS), as well as the fundamental sensing and actuation mechanisms therein. Students also learn the basic fabrication techniques for bulk and surface micromachining, discuss the primary forces in MEMS devices, and study the basic micro mechanical structures and microfluidics. *Preq:* CH 1020 and PHYS 1220.
- ECE 4380* Computer Communications 3 (3)** Digital data transmission techniques, modems and communications channels, communications software and protocols, multiprocessors and distributed processing; concurrency and cooperation of dispersed processors. *Preq:* Senior standing in Electrical or Computer Engineering or Computer Science.
- ECE 4390* Fiber Optics 3 (3)** Covers the underlying principles of design for optical fibers in practical systems. Examines optical fiber as a wave-guide using wave optics and ray optics. Discusses design criteria for using mono- and multi-mode fibers. Other topics include fabrication, measurement. *Preq:* ECE 3810 with a C or better. *Preq or concurrent enrollment:* MATH 4340 with a C or better.
- ECE 4400* Performance Analysis of Local Computer Networks 3 (3)** Introduction to the design and performance analysis of local computer networks. Emphasizes performance analysis of representative multi-access procedures. Three common types of networks are considered in detail. *Preq:* ECE 2720 and ECE 3170, each with a C or better.
- ECE 4420* Knowledge Engineering 3 (3)** Introduction to the theoretical and practical aspects of knowledge engineering or applied artificial intelligence. Topics include symbolic representation structures and manipulation, unification, production systems and structures, rule-based and expert systems, planning and AI system architectures; system design in PROLOG and LISP. Project is required. *Preq:* ECE 3220 and ECE 3520, each with a C or better.
- ECE 4460* Antennas and Propagation 3 (3)** Study of the theoretical and practical aspects of antenna design and utilization, input impedances, structural considerations, and wave propagation. *Preq:* ECE 3300 and ECE 3810; and one of MATH 3110 or MATH 4340, each with a C or better.
- ECE 4490* Computer Network Security 3 (1)** Hands-on practicum in the administration and security of modern network service emphasizing intrusion prevention techniques, detection, and recovery. *Preq:* Senior standing in Computer Engineering or Electrical Engineering. *Coreq:* ECE 4491.
- ECE 4491* Computer Network Security Laboratory 0 (4)** Non-credit laboratory to accompany ECE 4490. *Coreq:* ECE 4490.
- ECE 4530 Software Practicum 3 (1)** Students design and implement a software system that satisfies both a requirements and specifications document. The resulting system is tested for compliance. *Preq:* ECE 3220 and ECE 3520, each with a C or better. *Coreq:* ECE 4531.
- ECE 4531 Software Practicum Laboratory 0 (6)** Non-credit laboratory to accompany ECE 4530. *Coreq:* ECE 4530.
- ECE 4550* Robot Manipulators 3 (3)** Analysis of robot manipulator systems with special focus on interaction of these technologies with society. Emphasis is on rigid-link robot manipulator systems. Topics include history of robot technology, kinematics, dynamics, control, and operator interfaces. Case studies reinforce impact of robot technology on society and vice versa. *Preq:* MATH 2060 and MATH 3110, each with a C or better.
- ECE (ME) 4570* Fundamentals of Wind Power 3 (3)** Introduces wind turbine systems, including wind energy potential and application to power generation. Topics include wind energy principles, wind site assessment, wind turbine components, power generation machinery control systems, connection to the electric grid, and maintenance. May also be offered as ME 4570. *Preq:* ECE 2070 or ECE 3200 with a C or better.
- ECE 4590* Integrated Circuit Design 3 (2)** Design concepts and factors influencing the choice of technology; fundamental MOS device design; silicon foundries, custom and semicustom integrated circuits; computer-aided design software/hardware trends and future developments; hands-on use of CAD tools to design standard library cells; systems design considerations, testing, and packaging. *Preq:* ECE 3210 with a C or better. *Preq or concurrent enrollment:* MATH 3110 or MATH 4340, each with a C or better. *Coreq:* ECE 4591.
- ECE 4591* Integrated Circuit Design Laboratory 0 (2)** Non-credit laboratory to accompany ECE 4590. *Coreq:* ECE 4590.
- ECE 4600 Computer-Aided Analysis and Design 3 (3)** Principles and methods suited to the solution of engineering problems on the digital computer. Topics include widely used methods for the solution of the systems of algebraic and/or differential equations which arise in modeling of engineering systems, data approximation and curve fitting, continuous system simulation languages, and design-oriented programming systems. *Preq:* ECE 2620 and MATH 3110 and MATH 4340, each with a C or better.
- ECE 4610* Fundamentals of Solar Energy 3 (3)** Introduces solar energy conversion systems. Topics include environmental benefits of solar energy, solar thermal systems, concentration solar power, photovoltaic (PV) cell design and manufacturing, sizing of PV system, hybrid photovoltaic/thermal systems, energy storage, and urban/rural applications. *Preq:* ECE 3200 with a C or better.
- ECE 4670* Introduction to Digital Signal Processing 3 (3)** Introduction to characteristics, design, and applications of discrete time systems; design of digital filters; introduction to the Fast Fourier Transform (FFT); LSI hardware for signal processing applications. *Preq:* ECE 3300 with a C or better.
- ECE 4680* Embedded Computing 3 (2)** Principles of using computing in the larger context of a system. Topics include bus and processor design types (e.g. microprocessor, microcontroller, DSP), codecs, digital circuit power management, real time scheduling, and embedded operating systems. Lab work consists of projects on embedded hardware (e.g. PC-104+). *Preq:* ECE 2230 and ECE 3710, each with a C or better. *Coreq:* ECE 4681.
- ECE 4681* Embedded Computing Laboratory 0 (2)** Non-credit laboratory to accompany ECE 4680. *Coreq:* ECE 4680.
- ECE 4700 Vehicle Electronics 3 (3)** Introduction to vehicle electronic systems and networks. Topics include a review of electronic systems in automotive and aerospace applications; vehicle components, sensors and actuators; communication busses; electric power generation and distribution in vehicle systems; vehicle diagnostics; reliability; and trends in vehicle system design. *Preq:* ECE 3200 with a C or better.
- ECE 4710 Electric Vehicles and Energy Storage 3 (3)** Introduction to hybrid electric propulsion systems and energy storage systems. Topics include a review of fundamentals of electric vehicles and hybrid electric vehicles architectures covering reasons for hybridization, energy analysis of architecture and components; overview of energy storage systems (batteries and supercapacitors); modeling of components; vehicle simulation; and supervisory control. *Preq:* ECE 3200 with a C or better.
- ECE 4730* Introduction to Parallel Systems 3 (3)** Introduces parallel computer architectures and their programming. Includes an introduction to MPI and OpenMP and a number of engineering problems, including numerical simulations. Introduces scalability analysis. *Preq:* ECE 3220 or ECE 3290, each with a C or better.

ECE (CPSC) 4780* General Purpose Computation on Graphical Processing Units 3 (3) Instruction in the design and implementation of highly parallel, GPU-based solutions to computationally intensive problems from a variety of disciplines. The OpenCL language with inter-operable OpenGL components is used. Applications to models of physical systems are discussed in detail. May also be offered as CPSC 4780. *Prq:* CPSC 2120 or ECE 2230.

ECE 4910 Undergraduate Honors Research 1-6 (1-6) Individual research projects conducted under the direct supervision and guidance of a faculty member. May be repeated for a maximum of six credits.

ECE 4920* Special Problems 1-3 (1-3) Special assignment in electrical or computer engineering. Some typical assignments include computer programs, term papers, technical literature searches, hardware projects, and design project leadership. May be taken only once for credit.

ECE 4930* Selected Topics 1-3 (1-3) Classroom study of current and new technical developments in electrical and computer engineering. May be repeated for a maximum of six credits, but only if different topics are covered. *Prq:* Consent of instructor.

ECE 4950 Integrated System Design I 2 (1) Considers engineering design of systems in a continuous process of project definition, planning, execution, and evaluation. This process includes consideration of both technical and non-technical factors in design. Strong emphasis is placed on the development of effective technical communications skills, particularly oral communications competency. *Prq:* Electrical Engineering major and ECE 3200 and ECE 3300 and ECE 3600 and ECE 3800, each with a C or better; or Computer Engineering major and ECE 3200 and ECE 3220 and ECE 3300 and ECE 3520 and ECE 3710, each with a C or better. *Coreq:* ECE 4951.

ECE 4951 Integrated System Design I Laboratory 0 (3) Non-credit laboratory to accompany ECE 4950. *Coreq:* ECE 4950.

ECE 4960 Integrated System Design II 2 (6) Project-oriented course which brings together electrical and computer engineering students of dissimilar training in teams or project groups. Group assignments are designed to develop an appreciation for individual and creative thinking, as well as team effort. *Prq:* Electrical Engineering major and ECE 3210 and ECE 3710 and ECE 3810 and ECE 4090 and ECE 4950, each with a C or better; or Computer Engineering major and ECE 4090 and ECE 4950, each with a C or better.

ECE 4990 Creative Inquiry—Electrical and Computer Engineering 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Includes Honors sections. *Prq:* Consent of faculty member/mentor.

ECONOMICS

Professors: S.L. Baier, H. Bodenhorn, W.R. Dougan, M. Espey, R.K. Fleck, T. W. Hazlett, R.D. Sauer, Jr., *Chair;* C.J. Simon, Jr., R.F. Tamura, R.D. Tollison, P.W. Wilson; *Associate Professors:* F.A. Hanssen, M.J. Jerzmanowski, M. Lewis, S. Mityakov, S.R. Templeton, K.K. Tsui, P. Warren; *Assistant Professors:* S. Barkowski, P. Blair, C. Lam, D. Miller, J. Oliveira, D. Wood; *Visiting Professor:* G.P. Dwyer, Jr.

ECON 2000 Economic Concepts 3 (3) One-semester survey of basic economic concepts that offers an overview of both microeconomics and macroeconomics. Not intended for business majors or other students seeking a comprehensive introduction to economic analysis and its applications. Credit will not be given to students who have received credit for ECON 2110 or 2120.

ECON 2110 Principles of Microeconomics 3 (3) Introduction to economic reasoning and its application to the study of the behavior of consumers and business firms. Particular topics include competition, monopoly, international trade, and the impact of selected public policies. Intended as the first of a two-semester sequence in the foundations of economics. Includes Honors sections.

ECON 2120 Principles of Macroeconomics 3 (3) Continuation of ECON 2110 in which fundamental economic principles are applied to the study of aggregate economic performance. Topics include the forces determining the rates of inflation, unemployment, and economic growth, with particular emphasis on the influence of fiscal and monetary policies through financial markets. Includes Honors sections. *Prq:* ECON 2110.

ECON 3010 Economics of Labor 3 (3) Introduces students to the economics of the labor market and labor relations. Considers the theories of wages and employment, determination, unemployment, investment in human capital, discrimination, and public policy toward the labor market. Also considers the role of labor unions. May not be used to satisfy requirements for a degree in Economics. *Prq:* ECON 2110.

ECON 3020 Money and Banking 3 (3) Considers the function of money and banking in both the product and financial markets. Special emphasis is placed on monetary theory and current problems of monetary policy. May not be used to satisfy requirements for a degree in Economics. *Prq:* ECON 2120.

ECON 3030 Economics and Sports 3 (3) Economic analysis of sports teams, leagues, and institutions. Analyzes basic economic issues using sports data. May not be used to satisfy requirements for a degree in Economics. Credit will not be given to students who have completed ECON 4260. *Prq:* ECON 2110.

ECON (MGT) 3060 Managerial Economics 3 (3) Uses tools of economic analysis in classifying problems in organizing and evaluating information, and in comparing alternative courses of action. Bridges the gap between economic theory and managerial practices. May not be used to satisfy requirements for a degree in Economics. May also be offered as MGT 3060. *Prq:* ECON 2110.

ECON 3070 Arbitration 3 (3) Analyzes dispute settlement procedures emphasizing mediation, fact-finding, and arbitration as they are used to resolve labor-management disputes in the public and private sectors. *Prq:* Consent of instructor.

ECON 3090 Government and Business 3 (3) Relationships between government and business, including, among other topics, government efforts to enforce competition; to regulate public utilities; and to protect the special interest of laborers, farmers, and consumers. May not be used to satisfy requirements for a degree in Economics. *Prq:* ECON 2110.

ECON 3100 International Economy 3 (3) Studies of the process of international commerce. Covers basic theory of trade and exchange rates, institutional and legal environment, current policy issues. Not open to students who have taken ECON 4120. May not be used to satisfy requirements for a degree in Economics. *Prq:* ECON 2110 and ECON 2120.

ECON 3140 Intermediate Microeconomics 3 (3) Analytical study of basic concepts of value and distribution under alternative market conditions. Includes Honors sections. *Prq:* ECON 2110.

ECON 3150 Intermediate Macroeconomics 3 (3) Macroeconomic problems of inflation and unemployment are focal points. Includes statistics (measures of real output and the price level) and theory (covering the sources of short-run fluctuations and long-run growth). Analyzes appropriate public policies addressing these issues. Includes Honors sections. *Prq:* ECON 2120.

ECON 3190 Environmental Economics 3 (3) Study of the application of economic logic to issues surrounding environmental management and policy. Examines individual, firm, and collective decision making as well as the evolution of regulatory approaches for controlling environmental use. *Prq:* ECON 3140.

ECON (ELE) 3210 Economics of Innovation 3 (3) Examines the nature of entrepreneurship and the contribution of innovation to economic growth. Investigates the organizational and institutional sources of innovation in different firms and different countries as well as the work of economic theorists concerning the role entrepreneurs play in bringing new products to market. May also be offered as ELE 3210. *Prq:* ECON 3060 or ECON 3140.

ECON 3250 Personnel Economics 3 (3) Study of various compensation and personnel practices firms employ. Explains when each of those practices should be followed to elicit the desired employee effort and labor force quality. Topics include piece-rate and time-rate systems, seniority-based incentive schemes, promotion contests, evaluation systems, mandatory retirement, and up-or-out rules. *Prq:* ECON 2110.

ECON 3400 Behavioral Economics 3 (3) Introduces the economic, sociological, and psychological aspects of decision making under uncertainty. Presents the psychology of prediction, intuitive prediction: biases and corrective procedures. Topics also include framing, choice with costly information, and social influences on individual behavior. *Prq:* ECON 2110.

- ECON 3440 Economics of Institutions and Property Rights 3 (3)** Study of fundamental property rights structures and institutions in the capitalist economy and the arrangements that create incentives to produce and exchange. *Preq:* ECON 2110 and ECON 2120.
- ECON 3500 Moral and Ethical Aspects of a Market Economy 3 (3)** Can a market system produce results that are fundamentally just? Is justice possible without voluntary exchange? Applies both economic and philosophical analyses to these questions. Emphasizes the causes, consequences, and morality of the distribution of wealth and income in a free-market system. Includes Honors sections. *Preq:* ECON 3140.
- ECON 3600 Public Choice 3 (3)** Covers the economic approach to political activities and institutions. Topics include voting, voting rules, constitutions, political competition, political business cycles, vote trading, interest groups, bureaucracy, committees, legislators, executives, and judges. Designed for Economics and non-Economics majors and requires only basic skills in microeconomics. *Preq:* ECON 2110.
- ECON 3900 Junior Honors Research 1 (1)** Readings and research in conjunction with an approved economics course at the 3000 or 4000 level. Honors status required. May be repeated for a maximum of three credits.
- ECON 3970 Creative Inquiry—in Economics I 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of four credits.
- ECON 4010 Labor Market Analysis 3 (3)** Develops the methods of economic analysis of labor markets. Requires students to apply these methods to problems of the labor market. Topics include labor demand and supply, human capital, occupational choice, compensating wage differentials, organizational wage structures and incentive systems, unemployment, and discrimination. *Preq:* ECON 3140.
- ECON 4020 Law and Economics 3 (3)** Application of economics to the law of property, torts, and contracts; regulation of markets, business organizations, and financial transactions; distribution of income and wealth; and criminal law. *Preq:* ECON 2110.
- ECON 4040 Comparative Economic Systems 3 (3)** Comparative analytical and historical study of the principal economic systems which have been important in the modern world including, among others, capitalism and socialism. *Preq:* ECON 3140.
- ECON 4050* Introduction to Econometrics 4 (3)** Introduction to methods of quantitative analysis of economic data. Reviews basic statistical methods and probability distribution. Topics include data management using professional statistical software applications; multiple regression analysis; hypothesis testing under conditions of multicollinearity, heteroscedasticity, and serial correlation. *Preq:* ECON 2110 and ECON 2120; and either MATH 1080 or MATH 2070; and STAT 3090 or STAT 3300. *Coreq:* ECON 4051.
- ECON 4051* Introduction to Econometrics Laboratory 0 (3)** Non-credit laboratory to accompany ECON 4050. *Coreq:* ECON 4050.
- ECON 4060* Advanced Econometrics 3 (3)** Reviews statistical inference using multiple regression (OLS) analysis and model specification. Topics include multicollinearity, heteroscedasticity, and serial correlation; two-staged least squares and instrumental variables models; simultaneous equations models; limited dependent variable models using maximum likelihood estimation and time-series analysis; and presentation of results in technical writing. *Preq:* ECON 4050.
- ECON 4100* Economic Development 3 (3)** Consideration and analysis of economic and related problems of underdeveloped countries. Attention is given to national and international programs designed to accelerate solution of these problems. *Preq:* ECON 3140.
- ECON 4110* Economics of Education 3 (3)** Analysis of economic issues related to education. The decision to invest in education, elementary and secondary school markets and reform, the market for college education, teacher labor markets, and education's effects on economic growth and income distribution. *Preq:* ECON 3140.
- ECON 4120 International Microeconomics 3 (3)** Analysis of the essential aspects of international economic linkages. Discusses gains and redistributive effects of trade and the barriers to trade within the context of a variety of economic models. Also discusses the history of trade policy and the political economy of its determination. *Preq:* ECON 3140.
- ECON 4130* International Macroeconomics 3 (3)** Examination of macroeconomic linkages between an individual country and the rest of the world and how these linkages are affected by the choice of exchange rate regimes. Topics include the relation between domestic and foreign interest rates and exchange rates and the ability to pursue independent monetary policies. *Preq:* ECON 3150.
- ECON 4190 Economics of Defense 3 (3)** Examines the American defense establishment in terms of resources utilized, alternative uses, and the contribution to the national economy and scientific progress generated by resources in a defense use. Discusses economic problems inherent in shifting resources between defense and nondefense uses and among alternative defense uses. *Preq:* ECON 3140.
- ECON 4200 Public Sector Economics 3 (3)** Study of the role of government and its proper functions and limitations in a market. Provision of goods and services by all levels of government and instruments of taxation are evaluated according to efficiency and equity criteria. Contemporary public sector issues are emphasized throughout. *Preq:* ECON 3140.
- ECON 4220* Monetary Economics 3 (3)** Intensive study of the role of monetary factors in economic change. Modern monetary theories and their empirical relevance for policy are developed against a background of monetary history and institutions. *Preq:* ECON 3140 and ECON 3150.
- ECON 4230* Economics of Health 3 (3)** Applies microeconomic theory to examine the demand for health services and medical care, the market for medical insurance, the behavior of physicians and hospitals, and the role of government in health-care provision and regulation. *Preq:* ECON 3140.
- ECON 4240* Organization of Industries 3 (3)** Empirical, historical, and theoretical analyses of market structure and concentration in American industry: the effects of oligopoly, monopoly, and cartelization upon price, output, and other policies of the firm; antitrust and other public policies and problems are studied. *Preq:* ECON 3140.
- ECON 4250* Antitrust Economics 3 (3)** Analysis of the economic and legal issues created by the exercise of market power. The motivation and execution of government policy towards mergers, predatory conduct, and various restraints of trade are intensively examined. *Preq:* ECON 3090 or ECON 3140.
- ECON 4260 Seminar in Sports Economics 3 (3)** Economic analysis of sports teams, leagues, and institutions. Topics include antitrust issues, public funding of sports venues, labor relations, wagering markets, athlete compensation, and application of economic principles to sports settings. Empirical research project is cornerstone of course. Includes Honors sections. *Preq:* ECON 3140 and ECON 4050.
- ECON 4270 Development of the American Economy 3 (3)** Explores several topics relevant to understanding the American experience. Considers the institutions and developments critical to America's ascendancy from a small country to a dominant global economic power. Investigates immigration, innovation, education, finance, and the changing role of race and gender in the economy. *Preq:* ECON 3140 and ECON 3150.
- ECON 4280* Cost-Benefit Analysis 3 (3)** Develops techniques for the appraisal of public expenditure programs with particular emphasis on investment in infrastructure. Topics include choice of an appropriate discount rate and the calculation of social costs and benefits in the presence of market distortions. *Preq:* ECON 3140.
- ECON 4290* Economics of Energy Markets 3 (3)** This course examines the economics of energy markets and energy policy. The unique features and characteristics of these important and interrelated markets are explored, and participants gain practical experience in connecting economic gain concepts to recent energy-related events and energy policy issues. *Preq:* ECON 3140.
- ECON 4300* Topics in Mathematical Economics 3 (3)** This course develops the mathematical tools underlying economic analysis and prepares students for doing advanced theoretical work in economics. The topics covered in this course provide excellent preparation for advanced economics courses, and lay the foundation for doing quantitative analysis associated with both career work and graduate study in economics. *Preq:* ECON 3140; and either MATH 1080 or MATH 2070.
- ECON 4350 Family Economics 3 (3)** Analysis of economic aspects of the family. Economics of marriage, divorce, fertility, public policies affecting the family, women's labor force participation, and the gender gap are studied using main economic theories and empirical studies. *Preq:* ECON 3140.
- ECON 4400* Game Theory 3 (3)** Introduction to the formal analysis of strategic interaction among rational, self-interested rivals. Basic theoretical aspects of games are discussed and applied to such topics as bargaining, voting, auctions, and oligopoly. *Preq:* ECON 3140 and MATH 1060; or ECON 4300.

ECON 4550* Applied Microeconomic Research 3 (3) Students conduct research in applied microeconomics. Topics vary according to student and professor interests. Students read papers in the literature, formulate their own economic hypotheses, and collect and analyze data to test those hypotheses. May be repeated for a maximum of nine credits, but only if different topics are covered. *Preq:* ECON 3140.

ECON (AGRB) 4570* Natural Resource Use, Technology, and Policy 3 (3) Focuses on economic analyses of actual, efficient, and sustainable uses of natural resources, impacts of technologies that affect these uses, and policies that affect development and use of such technologies. Resource-technology-policy combinations may vary, but an example is crude oil, hybrid automotive engines, and fuel economy standards. May also be offered as AGRB 4570. *Preq:* MATH 1020 or MATH 1060; and AGRB 3570 or ECON 3140.

ECON 4910 Senior Honors Thesis Research 3 (3) Reading and research for the Senior Honors Thesis. *Preq:* ECON 3140 and ECON 3150 and senior honors standing.

ECON 4920 Senior Honors Thesis Writing 3 (3) Writing and oral presentation of the Senior Honors Thesis. *Preq:* ECON 4910.

ECON 4960 Independent Study 1-3 (1-3) Research and writing on a selected economics topic chosen by the student. A written proposal must be approved by the instructor prior to the start of the semester. May be repeated for a maximum of six credits. *Preq:* ECON 3140.

ECON 4970 Creative Inquiry in Economics II 1-3 (1-3) Engages students in research projects selected by the Economics Department faculty. Research projects vary depending on faculty and student interest. May be repeated for a maximum of six credits. *Preq:* ECON 3140.

ECON 4980 Selected Topics in Economics 3 (3) In-depth treatment of topics not covered fully in regular courses. Topics vary from year to year. May be repeated for a maximum of nine credits, but only if different topics are covered. Includes Honors sections. *Preq:* ECON 3140 and ECON 3150.

ECON 4990 Senior Seminar in Economics 1-3 (1-3) Discussion of topics of current interest in economics. Students conduct directed research on a particular topic. *Preq:* Consent of instructor.

EDUCATION

Associate Professor: S.N. Rosenblith, Chair

ED 1010 Effective Strategies for College Success 3 (3) Provides knowledge of specific strategies to increase academic success for college students. Includes instruction in strategies to address engagement and participation, organizational and study skills, test taking, note taking, reading content area text, and writing.

ED 1030 Introduction to Content Specific Learning Strategies 2 (2) Through direct experiences, students develop strategies to become proficient problem solvers, design and perform experiments to test hypotheses, analyze connections between core content areas, construct meaning from reading in various disciplines, identify and use resources to improve learning, and communicate effectively. Students must be accepted into and have completed the first two years of the Emerging Scholars pre-college program to enroll in this course.

ED 1050 Orientation to Education 2 (2) Introduction to teaching addresses basic program requirements, SoE Conceptual Framework, state evaluation system, the nature of the diverse and multicultural classroom, standards and practices of professional conduct and requirements in teaching. A field experience involving tutoring in a P-12 classroom is required. *Coreq:* ED 1051.

ED 1051 Orientation to Education Laboratory 0 (1) Non-credit laboratory to accompany ED 1050. *Coreq:* ED 1050.

ED 1900 Leadership, Citizenship, and Community Service 3 (3) Provides active learning opportunities for students to understand better the system of government, learn the mechanics of how leadership can influence education and other initiatives, and develop interpersonal skills that will assist them throughout their professional lives. Culminates with a service learning plan for the students local community.

ED 1970 Creative Inquiry—Education 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

ED 2970 Creative Inquiry—Education 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

ED 3220 Responding to Emergencies 3 (2) Provides the citizen responder with the knowledge and skills necessary in a variety of emergencies to help sustain life and to minimize pain and the consequences of injury until professional help arrives. Includes first aid, CPR, and automated external defibrillation (AED). *Coreq:* ED 3221.

ED 3221 Responding to Emergencies Laboratory 0 (1) Non-credit laboratory to accompany ED 3220. *Coreq:* ED 3220.

ED 3970 Creative Inquiry—Education 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

ED 4050 Multiculturalism 3 (3) Introduces prospective teachers to the influence of culture on learning from an anthropological and historical perspective. *Preq:* HIST 1720 or HIST 1730.

ED 4380 Selected Topics in Education 1-3 (1-3) Specific education topics not found in other courses are selected for in-depth study. May be repeated for a maximum of 12 credits, but only if different topics are covered.

ED 4390 Independent Study in Education 1-3 (1-3) Study of selected topics in education under the direction of a faculty member chosen by the student. Student and faculty member develop a course of study different from any existing courses and designed for the individual student. May be repeated for a maximum of 12 credits, but only if different topics are covered.

ED 4410* Middle School Curriculum 3 (3) Concepts and methods for teaching middle school students. Discusses nature of middle school students, teacher characteristics, curricular and co-curricular programs, organization, and teaching.

ED 4970 Creative Inquiry—Education 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

ED 4990 Education Honors Capstone 1-6 (1-6) Students seeking departmental honors complete honors research under faculty mentors. Students take a minimum of six hours across at least two semesters. May be repeated for a maximum of 12 credits. *Preq or concurrent enrollment:* EDF 3010 and EDF3020. *Coreq:* ED 4991.

ED 4991 Education Honors Capstone Laboratory 0 (4) Non-credit laboratory to accompany ED 4990. *Coreq:* ED 4990.

EDUCATIONAL COUNSELING

EDC 1990 Creative Inquiry—Counselor Education 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.

EDC 2340 Introduction to Addictions: Basic Education and Prevention 3 (3) Basic review of addictions and chemical dependence. Gives future educators skills in the identification of chemical abuse, techniques for intervention, and methods of prevention education. SOC 3960 and 3970 are recommended as follow-up courses for those interested in pursuing the topic.

EDC 2990 Creative Inquiry—Counselor Education 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.

EDC 3900 Student Development Theory, Leadership, and Counseling Skills for Student Leaders 3 (3) Introduction to theoretical and practical applications of student development and leadership on the university campus. Develops skills assisting students with leadership development, problem solving, conflict resolution, confrontation, and referral. Explores legal and ethical issues for practitioners and effective utilization of resources available on the campus. May be repeated for a maximum of nine credits.

EDC 3990 Creative Inquiry—Counselor Education 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.

EDC 4990 Creative Inquiry—Counselor Education 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.

EARLY CHILDHOOD EDUCATION

Professor: D.A. Stegelin; *Assistant Professor:* A. Hall, S.M. Linder; *Clinical Faculty:* R.S.N. Wilson; *Lecturer:* J. Schumpert

EDEC 2200 Family, School, and Community Relationships 3 (3) Historical trends, theoretical models, and strategies of effective family/school/community relationships are examined. Special emphasis is placed on multicultural issues and on programs that support collaborative interaction with families that benefit children. *Preq:* EDEC 3000. *Coreq:* EDEC 3020.

EDEC 3000 Foundations of Early Childhood Education 3 (3) Philosophical and historical foundations of early childhood education, societal changes and influences, needs of young children and families, program differentiation, and future trends are examined through coursework and experiential activities. *Preq:* ED 1050 and Sophomore standing. *Coreq:* EDEC 3010.

EDEC 3010 Practicum in Early Childhood Settings I 1 (3) Experiences in early childhood settings that provide opportunities for working with young children in a variety of settings. Practicum I and II focus on child care settings for children ages three to four. Practicum I builds on foundations of early childhood by making connections between theory and practice. *Preq:* ED 1050 and Sophomore standing. *Coreq:* EDEC 3000.

EDEC 3020 Practicum in Early Childhood Settings II 1 (3) Experiences in early childhood settings that provide opportunities for working with young children in a variety of settings. Practicum I and II focus on child care settings for children ages three to four. Practicum II emphasizes building relationships with families of young children. *Preq:* EDEC 3010. *Coreq:* EDEC 2200.

EDEC 3030 Practicum in Early Childhood Settings III 1 (3) Experiences in early childhood settings that provide opportunities for working with young children in a variety of settings. Practicum III focuses on child care settings for children from birth to age two. This experience allows students to understand the developmental needs and capabilities of very young children. *Preq:* EDEC 3020. *Coreq:* EDEC 3360.

EDEC 3040 Practicum in Early Childhood Settings IV 1 (3) Experiences in early childhood settings that provide opportunities for working with young children in a variety of settings. Practicum IV focuses on four-year-old kindergartens in public school settings. This experience emphasizes the transition to formal school settings for young children. *Preq:* EDEC 3030. *Coreq:* EDEC 4200 and EDEC 4500.

EDEC 3360 Concepts of Play and Social Development of Infants and Young Children 3 (3) Study of the behavior of the preschool child from infancy through age five. Focus is placed on the role of play in influencing cognitive, social, emotional, physical, and language development. Includes Honors sections. *Preq:* EDEC 2200. *Coreq:* EDEC 3030.

EDEC 4000 Observation and Assessment in Clinical Settings 3 (9) Clinical experiences in early childhood settings prior to student teaching provide opportunities for observing, guiding, and assessing young children, birth to age eight, in a variety of high quality preschool and primary settings. Practicum spans the entire semester. To be taken Pass/No Pass only. *Preq:* EDEC 4500. *Coreq:* EDEC 4300 and EDEC 4400 EDEC 4600.

EDEC 4200 Early Childhood Science 2 (2) Students develop knowledge, skills, and attitudes needed to foster science education among young children. Emphasizes teaching strategies and techniques appropriate for young children (birth to age eight), understanding the unique learning needs of special populations, and integrating science across the curriculum. *Preq:* EDEC 3360. *Coreq:* EDEC 3040 and EDEC 4201 and EDEC 4500.

EDEC 4201 Early Childhood Science Laboratory 0 (2) Non-credit laboratory to accompany EDEC 4200. *Coreq:* EDEC 4200.

EDEC 4300 Early Childhood Mathematics 3 (3) Examination of theories and methods of teaching mathematics in terms of how young children develop mathematical thinking. Topics include problem solving, current issues, diversity, current technologies, reflective teaching, and applications of math in everyday life. *Preq:* General Education mathematics requirement; admission to the professional level. *Preq:* MATH 1150 and MATH 1160 and MATH 2160 and EDEC 4500. *Coreq:* EDEC 4000 and EDEC 4400 and EDEC 4600.

EDEC 4400 Early Childhood English Language Arts 3 (3) Examination of language arts across the early childhood curriculum and ways to develop and support children's language arts practices across content areas. *Preq:* EDEC 4500. *Coreq:* EDEC 4000 and EDEC 4300 and EDEC 4600.

EDEC 4500 Early Childhood Curriculum and Social Studies Methods 3 (3) Examination of how content related to social studies can be integrated with concepts across the early childhood curriculum. A focus is placed on identifying and understanding the curricular needs of young children and how to connect content areas through social studies concepts. *Preq:* EDEC 3360. *Coreq:* EDEC 3040 and EDEC 4200.

EDEC 4600 Critical Issues and Cultural Diversity in Early Childhood Education 3 (3) In depth analysis of current and critical issues in early childhood education using a critical multicultural education framework. Topics include critical multiculturalism education, examination of issues of equity and access, early childhood assessment, working in diverse settings, and meeting the educational needs of all learners. *Preq:* EDEC 4500. *Coreq:* EDEC 4000 and EDEC 4300 and EDEC 4400.

EDEC 4840 Directed Teaching in Early Childhood Education 9 (1) Supervised observation and teaching experiences in cooperation with nursery schools, kindergartens, and early elementary schools. Restricted to seniors or graduates who have completed prerequisite courses and have the cumulative grade-point average for graduation. *Preq:* EDEC 4000 and EDEC 4300 and EDEC 4400 and EDEC 4600. *Coreq:* EDEC 4841 and EDEC 4850.

EDEC 4841 Directed Teaching in Early Childhood Education Laboratory 0 (24) Non-credit laboratory to accompany EDEC 4840. *Coreq:* EDEC 4840.

EDEC 4850 Early Childhood Capstone 3 (3) Taken concurrently with student teaching. Students strengthen connections between theory and pedagogy; analyze and solve contemporary problems in early childhood education; and reflect upon their personal growth as educators. *Preq:* EDEC 4000 and EDEC 4300 and EDEC 4400 and EDEC 4600. *Coreq:* EDEC 4840.

ELEMENTARY EDUCATION

Professor: D.P. Reinking, D.A. Smith; *Associate Professors:* C.C. Deaton, D.B. Fleming, M.J. Spearman, A.M. Tyminski; *Assistant Professors:* M.W. Cole, A.E. Leonard, J. Malloy; *Clinical Faculty:* R.A. Kaminski; *Lecturer:* W.E. Holton

EDEL 3040 Instructional Planning, Management, and Communications 3 (3) Provides students with knowledge and techniques for short- and long-term planning of developmentally appropriate lessons. Students learn how to structure ADEPT lessons and activities to meet the needs of students; and learn techniques for time and behavior management, organization and effective communication with school audiences. *Preq:* EDF 3340 and admission to the professional level.

EDEL 3100 Arts in the Elementary School 3 (2) Introduces skills, theories and practices used to integrate visual arts, drama, music and dance in the elementary classroom. Emphasizes philosophies associated with art education, content information, curriculum for diverse learners, and use of tools, media, materials and techniques. *Preq:* Admission to Elementary Education, Special Education or Early Childhood Education majors. *Coreq:* EDEL 3101.

- EDEL 3101 Arts in the Elementary School Laboratory 0 (3)** Non-credit laboratory to accompany EDEL 3100. *Coreq:* EDEL 3100.
- EDEL 3110 Teaching Diverse Populations 3 (3)** Preservice teachers examine the role of teachers as they relate to culturally appropriate curricula, instruction, and evaluation. *Preq:* Admission to the professional level.
- EDEL 3210 Physical Education Methods and Content for Classroom Teachers 3 (3)** Provides education majors with a basic understanding of the methods and techniques utilized in teaching elementary physical education. Emphasizes acquiring a basic understanding of the movement education approach and the ability to teach integrated lessons utilizing this approach. *Preq:* Junior standing; and admission to the professional level; and EDF 3020 and EDF 3340. *Preq or concurrent enrollment:* EDEL 3100.
- EDEL 4010 Elementary Field Experience 3 (1)** Practical classroom experience prior to the student teaching semester for Elementary Education majors. For a twelve-week period, students spend two days per week in schools observing, tutoring individuals, conducting small group activities, and teaching the class. Students attend seminars on topics related to field experience. *Preq:* EDF 3340 and EDEL 3100 and EDEL 3210 and EDEL 4520, and admission to the professional level. *Coreq:* EDEL 4011.
- EDEL 4011 Elementary Field Experience Laboratory 0 (6)** Non-credit laboratory to accompany EDEL 4010. *Coreq:* EDEL 4010.
- EDEL 4050 Social Justice and 21st Century Learners 3 (3)** Using an integrated focus approach to social justice education, preservice teachers investigate an educational event and/or issue through a combination of race, gender or socioeconomic factors. Preservice teachers write personal classroom stories related to practice/praxis; and use technology to document stories of themselves, their mentor and/or their teacher education preparation. *Preq:* Admission to the professional level. *Coreq:* EDEL 4670 and EDLT 4620 and EDLT 4630.
- EDEL 4510 Elementary Methods in Science Teaching 3 (2)** Development of process skills, technical skills, and attitudes needed to foster increased confidence and commitment to the teaching of elementary science, with emphasis on teaching strategies and techniques and their implications for what we know of how children learn science. Includes Honors sections. *Preq:* BIOL 1090 and PHSC 1170 and PHSC 1180; and admission to the professional level. *Coreq:* EDEL 4511.
- EDEL 4511 Elementary Methods in Science Teaching Laboratory 0 (3)** Non-credit laboratory to accompany EDEL 4510. *Coreq:* EDEL 4510.
- EDEL 4520 Elementary Methods in Mathematics Teaching 3 (2)** Special emphasis is given to the development of understanding, skills, and attitudes in the elementary curriculum with focus on strategies, techniques, and materials for teaching elementary mathematics. Includes honors sections. *Preq:* MATH 1150 and MATH 1160 and MATH 2160 and MATH 3160; and admission to the professional level. *Coreq:* EDEL 4521 and EDLT 4620.
- EDEL 4521 Elementary Methods in Mathematics Teaching Laboratory 0 (3)** Non-credit laboratory to accompany EDEL 4520. *Coreq:* 4520.
- EDEL 4580 Health Education Methods and Content for the Classroom Teacher 3 (3)** Study of the content, methodology, and resource materials necessary for teaching comprehensive health education in public schools. Emphasizes the National Health Education Standards and the health behaviors of youth that are allied with the Coordinated School Health Program. *Preq:* Minimum grade-point average of 2.0.
- EDEL 4670 Principles and Strategies for Teaching English to Speakers of Other Languages in Elementary Schools 3 (3)** Introduces preservice teachers to theories and principles related to second language acquisition as applied in culturally and linguistically responsive classrooms. Presents instructional models and strategies for teaching the language acquisition process within a context of academics supportive of English language learners (ELLs) and their needs. *Preq:* Admission to the professional level. *Coreq:* EDEL 4050 and EDLT 4620 and EDLT 4630.
- EDEL 4820 Capstone Seminar in Elementary Teaching 3 (2)** Students strengthen connections between theory and pedagogy; analyze and solve contemporary problems in elementary education; and reflect upon their personal growth as educators within a social justice framework. *Preq:* EDEL 3100 and EDEL 3210 and EDEL 4010 and EDEL 4510 and EDEL 4520 and EDEL 4870 and EDEL 4880 and EDLT 4610; and admission to the professional level; and consent of area committee chair. *Coreq:* EDEL 4821 and EDEL 4830.
- EDEL 4821 Capstone Seminar in Elementary Teaching Laboratory 0 (3)** Non-credit laboratory to accompany EDEL 4820. *Coreq:* EDEL 4820.
- EDEL 4830 Directed Teaching in the Elementary School 9 (27)** Supervised observation and teaching experience in cooperation with selected elementary schools. Restricted to seniors or graduates who have completed prerequisite courses. *Preq:* EDEL 3100 and EDEL 3210 and EDEL 4010 and EDEL 4510 and EDEL 4520 and EDEL 4870 and EDEL 4880 and EDLT 4610; and admission to the professional level; and consent of area committee chair. *Coreq:* EDEL 4820.
- EDEL 4870 Elementary Methods in Social Studies Teaching 3 (2)** Introduction to methods, materials, and techniques needed to teach social studies in the elementary schools. *Preq:* GEOG 1030; and HIST 1010 or HIST 1020; and admission to the professional level. *Coreq:* EDEL 4871.
- EDEL 4871 Elementary Methods in Social Studies Teaching Laboratory 0 (3)** Non-credit laboratory to accompany EDEL 4870. *Coreq:* EDEL 4870.
- EDEL 4880 Elementary Methods in Language Arts Teaching 3 (2)** Introduction for pre-service teachers to the skills of the language arts other than reading and the methods, materials, and techniques needed to teach these skills to students in the elementary school. *Preq:* ENGL 1030 or ENGL 3850; and admission to the professional level. *Coreq:* EDEL 4881.
- EDEL 4881 Elementary Methods in Language Arts Teaching Laboratory 0 (3)** Non-credit laboratory to accompany EDEL 4880. *Coreq:* EDEL 4880.

EDUCATIONAL FOUNDATIONS

Professors: D.E. Barrett, R.P. Green Jr., D.M. Switzer; *Associate Professor:* S. N. Rosenblith, *Chair;* *Assistant Professors:* D.M. Boyer, D. Hero, F. Jamil, M. Qian, G. Ring P. Vargas; *Clinical Faculty:* R.D. Visser

EDF 3010 Principles of American Education 3 (3) Study of the legal basis, historical development, characteristics, and functions of educational institutions in the United States. Includes Honors sections. *Preq:* Sophomore standing and a 2.0 minimum grade-point average.

EDF 3020 Educational Psychology 3 (3) Introduction to classroom use of objectives, motivation theories, learning theories, tests and measurements, classroom management, and knowledge of exceptional learners. Includes Honors sections. *Preq:* Sophomore standing and a 2.0 minimum grade-point average.

EDF 3080 Classroom Assessment 3 (3) Introduction to classroom assessment and standardized testing. *Preq:* EDF 3020 and junior standing.

EDF (CTE) 3150 Technology Skills for Learning 1 (2) Students develop technology skills, such as creating Web pages and multimedia presentations in the context of general education class requirements. Products developed are linked within the School of Education e-portfolio. May also be offered as CTE 3150. *Preq:* Admission to Teacher Education program and ED 1050.

EDF (HIST) 3200 History of United States Public Education 3 (3) Historical survey of the development of United States public schools. May also be offered as HIST 3200. *Preq:* Junior standing.

EDF 3340 Child Growth and Development 3 (3) Introduction to lifespan development. Heavy emphasis is placed on the physical, social, emotional, and cognitive characteristics. Includes a minimum of five one-hour observation-participation visits to an elementary school. Includes Honors sections. *Preq:* Sophomore standing and a 2.0 minimum grade-point average.

EDF 3350 Adolescent Growth and Development 3 (3) Introduction to lifespan development. Emphasizes the physical, social, emotional, and cognitive characteristics of the 10- to 18-year old and the educational implications of those developmental characteristics. Includes Honors sections. *Preq:* Sophomore standing and a 2.0 minimum grade-point average.

EDF 4060 Philosophy, Schooling, and Educational Policy 3 (3) Analysis of the development of contemporary educational theory and its impact on current schooling practices and educational policy development.

EDF 4250 Instructional Technology Strategies 1 (2) Helps future teachers learn to use technology effectively in support of content area instruction. To be taken concurrently with either methods classes or during student teaching as directed by major. *Preq:* EDF 3150 or EDF 4800.

EDF 4800* Foundations of Digital Media and Learning 3 (2) Critical use of digital media for leadership and learning within societal and educational contexts. Course focuses on learner impact while exploring, developing, and evaluating technology-enhanced applications. Further develops competencies with new media literacies and addresses societal, cultural, ethical, and participatory issues and uses of digital media. Registration preference may be given to students enrolled in a teacher education program. *Coreq:* EDF 4801.

EDF 4801* Foundations of Digital Media and Learning Laboratory 0 (2) Non-credit laboratory to accompany EDF 4800. *Coreq:* EDF 4800.

EDF 4820* Advanced Educational Applications of Microcomputers 3 (2) Provides students with the knowledge and skills needed to apply microcomputer technology to the utilization and generation of educational software in accordance with sound educational principles. *Preq:* AGED 4800 or EDF 4800. *Coreq:* EDF 4821.

EDF 4821* Advanced Educational Applications of Microcomputers Laboratory 0 (2) Non-credit laboratory to accompany EDF 4820. *Coreq:* EDF 4820.

EDF 4900* Classroom Management 3 (3) Aids students in developing strategies and plans to manage a classroom effectively. Topics include both time and behavioral management. Students learn how to prevent problems as well as address problems once they have occurred. Includes Honors sections. *Preq:* EDF 3020 or PSYC 2010; and EDF 3340 or EDF 3350; and a 2.0 minimum grade-point ratio; or graduate standing.

EDF 4970* Instructional Media in the Classroom 3 (3) Integrated approach to the use of audiovisual media stressing systematic planning, selection, utilization, and evaluation as well as production of materials and equipment operation. *Preq:* 2.0 minimum grade-point average.

LITERACY

Professor: L.B. Gambrell; *Associate Professors:* P.J. Dunston, S.K. Fullerton, J.C. McNair; *Assistant Professor:* C.C. Bates; *Visiting Lecturer:* M.A. McBride

EDLT 1030 Learning Strategies 2 (3) Students learn strategies of active learning and critical thinking skills, which become an integral part of their natural thinking processes. Students learn how to generalize and apply newly acquired strategies to a variety of settings and situations.

EDLT 4580 Early Literacy: From Birth to Kindergarten 3 (3) Provides Early Childhood Education majors with knowledge of theory and research-based, developmentally appropriate instructional practices related to children's literacy development within the home and school from birth to kindergarten. Factors related to assessment and communication within and between the family, school, and teacher are addressed. *Preq:* Admission to the professional level.

EDLT 4590 Teaching Reading in the Early Grades: K-3 3 (3) Provides early childhood and Elementary Education majors an understanding of teaching reading in the elementary school setting in kindergarten through third grade. Students investigate general principles of language and literacy development and learn methods for teaching and assessing children's literacy. *Preq:* EDEC 3360 and EDF 3010 and EDF 3020 and admission to the professional level. Early Childhood Education majors must enroll in EDEC 4000 and EDLT 4590 during the same term.

EDLT 4600 Teaching Reading in the Elementary Grades: 2-6 3 (3) Provides preservice teachers with an understanding of teaching reading in the elementary setting in grades 2-6. Students investigate general principles of language and literacy development and learn methods for teaching and assessing children's literacy. *Preq:* EDF 3010 and EDF 3020 and EDF 3340 and admission to the professional level.

EDLT 4610 Content Area Reading: Grades 2-6 3 (2) Provides preservice teachers with an understanding of teaching content area literacy in grades 2-6. Students learn methods and strategies for teaching children to learn with and make use of expository texts. Comprehension, the role of expository texts, and vocabulary learning in content areas are presented. *Preq:* EDLT 4600 and admission to the professional level. *Coreq:* EDLT 4611.

EDLT 4611 Content Area Reading: Grades 2-6 Laboratory 0 (3) Non-credit laboratory to accompany EDLT 4610. *Coreq:* EDLT 4610.

EDLT 4620 Reading and Responding to Children's Literature in the Elementary Classroom 3 (3) Introduces children's literature across genres. Participants examine strategies for responding to children's literature through various modes and explore cultural issues and controversies related to children's literature. *Preq:* EDLT 4600 and admission to the professional level. *Coreq:* EDEL 4520.

EDLT 4630 Teaching Reading and Writing to English Language Learners 3 (3) Within a framework of the dimensions of cross-cultural knowledge and knowledge of theories and principles related to second language acquisition, participants develop understanding of the reading and writing processes and instructional models, strategies and tools that offer supportive learning for English language learners. *Preq:* EDLT 4600 and admission to the professional level.

EDLT 4980 Secondary Content Area Reading 3 (2) Designed for preservice teachers who are involved with field experiences prior to student teaching full time. Prepares content area teachers to teach the reading skills necessary for effective teaching of content area material. *Preq:* Admission to professional level. *Coreq:* EDLT 4981.

EDLT 4981 Secondary Content Area Reading Laboratory 0 (2) Non-credit laboratory to accompany EDLT 4980. *Coreq:* EDLT 4980.

SECONDARY EDUCATION

Associate Professors: S.M. Che, M.P. Cook, J.C. Marshall; *Assistant Professors:* S. Cridland-Hughes, L.J. King; *Clinical Faculty:* C.L. Haltiwanger

EDSC 2260 A Professional Approach to Secondary Algebra 3 (3) Focuses on the pedagogical content knowledge needed to teach algebra effectively. It helps students master algebraic concepts, connections and representations at a deep level and solve meaningful real world problems. Students also explore the history of mathematical and algebraic thought and create meaningful and engaging lessons. *Preq:* Secondary Education major in Mathematics Teaching Area or Mathematics Teaching major.

EDSC 3240 Practicum in Secondary English 3 (2) Pre-service secondary English teachers gain both content and pedagogical knowledge by observing and reflecting upon the classroom practices of selected in-service high school English teachers. *Coreq:* EDSC 3241.

EDSC 3241 Practicum in Secondary English Laboratory 0 (3) Non-credit laboratory to accompany EDSC 3240. *Coreq:* EDSC 3240.

EDSC 3260 Practicum in Secondary Mathematics 3 (2) Pre-service secondary mathematics teachers gain both content and pedagogical knowledge by observing and reflecting upon the classroom practices of selected in-service high school mathematics teachers. *Coreq:* EDSC 3261.

EDSC 3261 Practicum in Secondary Mathematics Laboratory 0 (3) Non-credit laboratory to accompany EDSC 3260. *Coreq:* EDSC 3260.

EDSC 3270 Practicum in Secondary Science 3 (2) Pre-service secondary science teachers gain both content and pedagogical knowledge by observing and reflecting upon the classroom practices of selected in-service high school science teachers. *Coreq:* EDSC 3271.

EDSC 3271 Practicum in Secondary Science Laboratory 0 (3) Non-credit laboratory to accompany EDSC 3270. *Coreq:* EDSC 3270.

EDSC 3280 Practicum in Secondary Social Studies 3 (2) Pre-service secondary social studies teachers gain both content and pedagogical knowledge by observing and reflecting upon the classroom practices of selected in-service high school social studies teachers. *Coreq:* EDSC 3281.

EDSC 3281 Practicum in Secondary Social Studies Laboratory 0 (3) Non-credit laboratory to accompany EDSC 3280. *Coreq:* EDSC 3280.

EDSC 4120 Directed Student Teaching in Secondary School Subjects 12 (1) Program of supervised observation and teaching in cooperation with selected public schools. Opportunities are provided for prospective teachers to obtain experiences in the subject area. Students are sectioned according to teaching fields: English, social science, mathematical sciences, modern languages, science. Enrollment is limited. *Coreq:* EDSC 4121.

EDSC 4121 Directed Student Teaching in Secondary School Subjects Laboratory 0 (33) Non-credit laboratory to accompany EDSC 4120. *Coreq:* EDSC 4120.

- EDSC 4170 Teaching Internship in the Secondary School 6 (16)** Full-time, supervised teaching internship for one semester in cooperation with a participating South Carolina secondary school. Reserved for students seeking certification in critical-need teaching areas. May be repeated for a maximum of 12 credits. To be taken Pass/No Pass only. *Preq:* EDF 3010 and EDF 3020 and EDF 3350 and EDLT 4980; and one of the following: EDSC 4240, 4250, 4260, 4270; and consent of School of Education by way of approving student's application.
- EDSC 4240 Teaching Secondary English 3 (2)** Development of instructional practices and materials appropriate for secondary English; familiarization with curriculum materials; includes field experiences in local schools in preparation for student teaching. Taught fall semester only. Includes Honors sections. *Preq:* Second semester Junior standing, admission to the professional level, ED 1050 and EDF 3010 and EDF 3020 and EDF 3350; at least 18 hours of English coursework and a minimum grade-point average of 2.5. *Preq or concurrent enrollment:* EDLT 4980. *Coreq:* EDSC 4241.
- EDSC 4241 Teaching Secondary English Laboratory 0 (2)** Non-credit laboratory to accompany EDSC 4240. *Coreq:* EDSC 4240.
- EDSC 4250 Teaching Secondary Modern Languages 3 (2)** Development of instructional practices and materials appropriate for secondary modern languages; familiarization with curriculum materials; includes field experiences in local schools. Taught fall semester only. *Preq:* Second semester Junior standing, admission to the professional level, ED 1050 and EDF 3010 and EDF 3020 and EDF 3350; at least 18 hours of English coursework and a minimum grade-point average of 2.5. *Preq or concurrent enrollment:* EDLT 4980. *Coreq:* EDSC 4251.
- EDSC 4251 Teaching Secondary Modern Languages Laboratory 0 (2)** Non-credit laboratory to accompany EDSC 4250. *Coreq:* EDSC 4250.
- EDSC 4260 Teaching Secondary Mathematics 3 (2)** Development of instructional practices appropriate for secondary mathematics; familiarization with curriculum materials, planning, and implementation of lessons; includes field experiences in local schools. Taught fall semester only. Includes Honors sections. *Preq:* Admission to the professional level, ED 1050 and EDF 3010 and EDF 3020 and EDF 3350; at least 18 hours of English coursework and a minimum grade-point average of 2.5. *Preq or concurrent enrollment:* EDLT 4980. *Coreq:* EDSC 4261.
- EDSC 4261 Teaching Secondary Mathematics Laboratory 0 (2)** Non-credit laboratory to accompany EDSC 4260. *Coreq:* EDSC 4260.
- EDSC 4270 Teaching Secondary Science 3 (2)** Development of instructional practices and materials for teaching secondary school science (biological, earth, and physical sciences); familiarization with secondary science curriculum materials; includes field experiences in local schools. Taught fall semester only. Includes Honors sections. *Preq:* Second semester Junior standing, admission to the professional level, ED 1050 and EDF 3010 and EDF 3020 and EDF 3350; at least 18 hours of English coursework and a minimum grade-point average of 2.5. *Preq or concurrent enrollment:* EDLT 4980. *Coreq:* EDSC 4271.
- EDSC 4271 Teaching Secondary Science Laboratory 0 (2)** Non-credit laboratory to accompany EDSC 4270. *Coreq:* EDSC 4270.
- EDSC 4280 Teaching Secondary Social Studies 3 (2)** Development of instructional practices and materials appropriate for secondary social studies; familiarization with curriculum materials; includes field experiences in local schools in preparation for student teaching. Taught fall semester only. Includes Honors sections. *Preq:* Second semester Junior standing, admission to the professional level, ED 1050 and EDF 3010 and EDF 3020 and EDF 3350; at least 18 hours of English coursework and a minimum grade-point average of 2.5. *Preq or concurrent enrollment:* EDLT 4980. *Coreq:* EDSC 4281.
- EDSC 4281 Teaching Secondary Social Studies Laboratory 0 (2)** Non-credit laboratory to accompany EDSC 4280. *Coreq:* EDSC 4280.
- EDSC 4370* Technology in Secondary Mathematics 3 (3)** Students learn how to integrate calculators, data collectors, and computers in the secondary mathematics curriculum. They solve problems from middle school, Algebra I, Geometry, and Algebra II courses. *Preq:* Second semester Junior standing, admission to the professional level.
- EDSC 4440 Teaching Internship in Secondary English 9 (27)** Interns design, implement, and critically reflect upon instructional units and teaching practices in supervised secondary English classes. Interns must provide evidence of performance that meets national and state teaching standards for secondary English. Taught spring semester only. *Preq:* EDSC 4240. *Coreq:* EDSC 4540.
- EDSC 4460 Teaching Internship in Secondary Mathematics 9 (27)** Prospective secondary mathematics teachers apply teaching and learning theories in a field-based setting through an internship in a secondary public school classroom. Taught spring semester only. *Preq:* EDSC 4260. *Coreq:* EDSC 4560.
- EDSC 4470 Teaching Internship in Secondary Science 9 (27)** Supervised teaching internship in assigned secondary public school science classroom. Meets part of requirement for S.C. science teaching certification. Taught spring semester only. *Preq:* EDSC 4270. *Coreq:* EDSC 4570.
- EDSC 4480 Teaching Internship in Secondary Social Studies 9 (27)** Supervised observation and teaching in cooperation with a mentor teacher in a secondary public school. Students design, implement, and critically reflect upon curricular and instructional practices in public secondary social studies classrooms. Taught spring semester only. *Preq:* EDSC 4280. *Coreq:* EDSC 4580.
- EDSC 4540 Secondary English Capstone Seminar 3 (2)** Seminar in conjunction with EDSC 4440. Interns reflect upon and solve problems regarding teaching events, share effective teaching practices, and devise ways to document dimensions of effective teaching. Taught spring semester only. *Preq:* EDSC 4240. *Coreq:* EDSC 4440 and EDSC 4541.
- EDSC 4541 Secondary English Capstone Seminar Laboratory 0 (3)** Non-credit laboratory to accompany EDSC 4540. *Coreq:* EDSC 4540.
- EDSC 4560 Secondary Mathematics Capstone Seminar 3 (2)** Capstone seminar accompanying supervised secondary mathematics teaching internship. Satisfies part of the requirements for South Carolina secondary certification. Taught spring semester only. *Preq:* EDSC 4260. *Coreq:* EDSC 4460 and EDSC 4561.
- EDSC 4561 Secondary Mathematics Capstone Seminar Laboratory 0 (3)** Non-credit laboratory to accompany EDSC 4560. *Coreq:* EDSC 4560.
- EDSC 4570 Secondary Science Capstone Seminar 3 (2)** Capstone seminar accompanying supervised high school science teaching internship. Satisfies part of requirement for South Carolina secondary science certification. Offered spring semester only. *Preq:* EDSC 4270. *Coreq:* EDSC 4470 and EDSC 4571.
- EDSC 4571 Secondary Science Capstone Seminar Laboratory 0 (3)** Non-credit laboratory to accompany EDSC 4570. *Coreq:* EDSC 4570.
- EDSC 4580 Secondary Social Studies Capstone Seminar 3 (2)** Capstone seminar accompanying supervised high school social studies teaching internship. Satisfies part of requirement for S.C. secondary certification. Offered spring semester only. *Preq:* EDSC 4280. *Coreq:* EDSC 4480 and EDSC 4581.
- EDSC 4581 Secondary Social Studies Capstone Seminar Laboratory 0 (3)** Non-credit laboratory to accompany EDSC 4580. *Coreq:* EDSC 4580.
- EDSC (BIOL) 4820* Laboratory Techniques for Teaching Science 3 (1)** Focuses on basic lab skills needed to plan, prepare, and conduct inquiry-based laboratories and to familiarize pre-service teachers with a variety of scientific equipment and their methodologies. Topics include ways to integrate technology into the classroom, lab safety, and the development of inquiry-based classroom activities. May also be offered as BIOL 4820. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110. *Coreq:* EDSC 4821.
- EDSC (BIOL) 4821* Laboratory Techniques for Teaching Science Laboratory 0 (6)** Non-credit laboratory to accompany EDSC 4820. May also be offered as BIOL 4821. *Coreq:* EDSC 4820.
- EDSC (ENGL) 4850* Composition and Language Studies for Teachers 3 (3)** Examines the principles and practices of composing and teaching composition. Includes a historical study of English language with attention to phonology, morphology, syntax, semantics, and practical aspects of language grammars. Serves as a practicum in composing and assessing processes, collaborative learning, writers purposes, audience expectations, and language conventions. May also be offered as ENGL 4850. *Preq:* ENGL 3100.

SPECIAL EDUCATION

Professors: A. Katsiyannis, P.M. Stecker; *Associate Professors:* M.J. Hodge, J.B. Ryan; *Assistant Professors:* R. Ennis, J. Farmer, S.M. Mackiewicz; *Clinical Faculty:* B. Romansky

EDSP 3700 Introduction to Special Education 3 (3) Survey of students with disabilities and with gifts/talents. Individuals with Disabilities Education Act is emphasized, including general educator's role in serving students with special needs. Characteristics, assessment, and effective instructional procedures for students of varying exceptionalities are addressed. Includes Honors sections. Students must have a minimum grade-point average of 2.0 to enroll in this course.

EDSP 3720 Characteristics and Instruction of Individuals with Learning Disabilities 3 (3) In-depth coverage of characteristics and identification procedures for individuals with learning disabilities. Effective instructional strategies are addressed. Students participate in field experiences throughout the semester. Offered fall semester only. *Preq:* EDSP 3700. *Coreq:* EDSP 3721 and EDSP 3740.

EDSP 3721 Characteristics and Instruction of Individuals with Learning Disabilities Laboratory 0 (1) Non-credit laboratory to accompany EDSP 3720. *Coreq:* EDSP 3720.

EDSP 3730 Characteristics and Instruction of Individuals with Intellectual Disabilities and Autism 3 (3) In-depth study of the etiology, assessment procedures, learning and behavioral characteristics, and effective instructional strategies related to the education of individuals with intellectual disabilities and autism. Students participate in a field experience throughout the semester. *Preq:* EDSP 3720 and EDSP 3740; and admission to professional level. *Preq or concurrent enrollment:* EDSP 3750. *Coreq:* 3731 and EDSP 4910.

EDSP 3731 Characteristics and Instruction of Individuals with Intellectual Disabilities and Autism Laboratory 0 (1) Non-credit laboratory to accompany EDSP 3730. *Coreq:* EDSP 3730.

EDSP 3740 Characteristics and Strategies for Individuals with Emotional/Behavioral Disorders 3 (3) In-depth coverage of characteristics and identification procedures for individuals with emotional or behavioral disorders. Effective instructional strategies and behavior management are addressed. Students participate in field experiences throughout the semester. *Preq:* EDSP 3700; and admission to professional level. *Coreq:* EDSP 3720 and EDSP 3741.

EDSP 3741 Characteristics and Strategies for Individuals with Emotional/Behavioral Disorders Laboratory 0 (1) Non-credit laboratory to accompany EDSP 3740. *Coreq:* EDSP 3740.

EDSP 3750 Early Intervention Strategies for Young Children with Special Needs 3 (3) Provides students with a working knowledge of the history and legal precedence for providing early intervention services, the characteristics of young children with special needs and their families, and effective instructional techniques for working with this population. Students participate in field experiences throughout the semester. *Preq:* EDSP 3700. *Coreq:* EDSP 3751.

EDSP 3751 Early Intervention Strategies for Young Children with Special Needs Laboratory 0 (1) Non-credit laboratory to accompany EDSP 3750. *Coreq:* EDSP 3750.

EDSP 4900 Teaching Writing to Students with Disabilities 1 (1) Prepares students to deliver writing instruction and to administer curriculum-based assessments. Effective instructional strategies for individuals with disabilities in the areas of written expression, writing mechanics and spelling are addressed. *Preq:* EDSP 4910 and admission to the professional level. *Coreq:* EDSP 4920 and EDSP 4930 and EDSP 4940 and EDSP 4960 and EDSP 4970.

EDSP 4910 Educational Assessment of Individuals with Disabilities 3 (2) Introduction to assessment process (verification) in special education. Includes procedural safeguards; data collections via informal and standardized procedures; issues in assessment; psychometric properties of standardized tests; and administration, scoring, and interpretation of selected instruments. Offered spring semester only. *Preq:* EDSP 3720 and EDSP 3740; and admission to the professional level. *Coreq:* EDSP 3730 and EDSP 4911.

EDSP 4911 Educational Assessment of Individuals with Disabilities Laboratory 0 (2) Non-credit laboratory to accompany EDSP 4910. *Coreq:* EDSP 4910.

EDSP 4920 Mathematics Instruction for Individuals with Mild Disabilities 3 (3) Prepares students to provide explicit instruction in mathematics for individuals with mild disabilities. Students learn to assess, analyze and teach math skills systematically. Offered fall semester only. *Preq:* EDSP 4910; and admission to the professional level. *Coreq:* EDSP 4900 and EDSP 4930 and EDSP 4940 and EDSP 4960 and EDSP 4970.

EDSP 4930 Classroom and Behavior Management for Special Educators 3 (3) Students describe various intervention strategies for increasing and maintaining appropriate behaviors and for decreasing or eliminating inappropriate behaviors. Students accurately recognize, record, and chart inappropriate behaviors; employ the least restrictive intervention; foster self-management skills; and develop preventive strategies and classwide systems for managing academic and social behavior. Offered fall semester only. *Preq:* EDSP 4910; and admission to the professional level. *Coreq:* EDSP 4900 and EDSP 4920 and EDSP 4940 and EDSP 4960 and EDSP 4970.

EDSP 4940 Teaching Reading to Students with Mild Disabilities 3 (3) Emphasizes the knowledge and skills necessary for teaching reading to students with mild disabilities. Offered fall semester only. *Preq:* EDSP 4910; and admission to the professional level. *Coreq:* EDSP 4900 and EDSP 4920 and EDSP 4930 and EDSP 4960 and EDSP 4970.

EDSP 4950 Communication and Collaboration in Special Education 3 (3) Focuses on effective communication skills for preservice special education teachers to encourage collaboration among relevant stakeholders and improve outcomes for individuals with disabilities. *Preq:* EDSP 4960. *Coreq:* EDSP 4980.

EDSP 4960 Special Education Field Experience 3 (9) Supervised practical experience prior to Directed Teaching for preservice special education teachers preparing to teach individuals with mild/moderate disabilities. Offered fall semester only. *Preq:* EDSP 4910; and admission to the professional level. *Coreq:* EDSP 4900 and EDSP 4920 and EDSP 4930 and EDSP 4940 and EDSP 4970.

EDSP 4970 Secondary Methods for Individuals with Disabilities 3 (3) Preparation for working with students with mild/moderate disabilities in secondary schools. Focus is on literature, methods, and materials for providing instruction in transition, self-determination, knowledge within content areas, functional skills, and integration into the community. Offered fall semester only. *Preq:* EDSP 4910; and admission to the professional level. *Coreq:* EDSP 4900 and EDSP 4920 and EDSP 4930 and EDSP 4940 and EDSP 4960.

EDSP 4980 Directed Teaching in Special Education 12 (34) Comprehensive course providing a full-time, semester-long experience for preservice special education teachers who plan to teach individuals with mild/moderate disabilities. Generally the last course in the program; provides teaching experience under the supervision of University and school personnel. Offered spring semester only. *Preq:* EDSP 4960 *Coreq:* EDSP 4950.

ENVIRONMENTAL ENGINEERING AND SCIENCE

Professors: T.A. DeVol, D.L. Freedman, T.J. Overcamp, M.A. Schlautman; *Associate Professors:* E.R. Carraway, K.T. Finneran, B.A. Powell; *Assistant Professors:* M. Carbajales-Dale, D.A. Ladner, L. Schuller-Nichols

EES 2010 Environmental Engineering Fundamentals I 3 (3) Overview of topics and engineering application areas that comprise the environmental engineering profession. Significant emphasis is given to development of oral and written communication skills needed by the engineering professional and application of engineering fundamentals to environmental systems. *Preq:* CH 1010 and ENGR 1060 and MATH 1080, each with a grade of C or better. *Preq or concurrent enrollment:* CHE 1300 or ENGR 1070.

EES 2020 Environmental Engineering Fundamentals II 4 (3) Overview of fundamentals related to environmental engineering processes, including water treatment, wastewater treatment, solid and hazardous waste management, air pollution control, risk assessment, and pollution prevention strategies. Laboratories cover measurement techniques and applications to process engineering. *Preq:* CH 1020; and EES 2010; and CHE 1300 or ENGR 1090. Students must have a C or better in ENGR 1090 to meet the prerequisite requirement. *Coreq:* EES 2021.

EES 2021 Environmental Engineering Fundamentals II Laboratory 0 (3) Non-credit laboratory to accompany EES 2020. *Coreq:* EES 2020.

- EES 3000 Honors Seminar: Introduction to Research in Environmental Engineering I (1)** Provides an introduction to environmental engineering research. Students attend seminars describing how a research program is developed, including the scientific method and hypothesis testing. Students are expected to write and revise a research proposal, which is reviewed by the faculty advisor. *Preq:* Consent of instructor and membership in Calhoun Honors College.
- EES 3010 Honors Research in Environmental Engineering I 3 (9)** In this portion of the undergraduate honors research program in environmental engineering, students begin their environmental engineering research project. *Preq:* EES 3000 and consent of instructor and membership in the Calhoun Honors College.
- EES 3030 Water Treatment Systems 2 (2)** Study of fundamental principles, rational design considerations, and operational procedures of the unit operations and processes employed in water treatment. Introduces the integration of unit operations and processes into water treatment systems. *Preq:* EES 2020. *Coreq:* EES 3040 and EES 3050.
- EES 3040 Wastewater Treatment Systems 2 (2)** Study of fundamental principles, rational design considerations, and operational procedures of the unit operations and processes employed in wastewater treatment. Both physiochemical and biological treatment techniques are discussed. Introduces the integration of unit operations and processes into wastewater treatment systems. *Preq:* EES 2020. *Coreq:* EES 3030 and EES 3050.
- EES 3050 Water and Wastewater Treatment Laboratory 1 (3)** Laboratory exercises to accompany EES 3030 and EES 3040 in selected water and wastewater treatment operations and processes. Emphasis is on understanding of fundamental principles and operational procedures, experimental design, data analysis, use of experimental data in engineering design applications, and writing of engineering reports. *Preq:* EES 2020. *Coreq:* EES 3030 and EES 3040.
- EES 3100 Introduction to Nuclear Engineering 3 (3)** Technological, industrial and medical applications of ionizing radiation and radioactive materials. Topics to be covered include basic nuclear physics, interactions of radiation with matter, radiation detection and measurement, fission reactors, and the nuclear fuel cycle. *Preq:* MATH 2080 with a C or better.
- EES 4000 Honors Research in Environmental Engineering II 3 (9)** Continuation of EES 3010. Students continue research work on their honors environmental engineering project. *Preq:* EES 3010 and consent of instructor and membership in the Calhoun Honors College.
- EES 4010* Environmental Engineering 3 (3)** Introduction to the field of environmental engineering. Topics include environmental phenomena, impact of pollutants in the aquatic environment, solid-waste management, air pollution control, radiological health, and simple water and wastewater treatment systems. *Preq:* Junior standing in engineering or consent of instructor. *Preq:* Junior standing in the College of Engineering and Science. *Preq or concurrent enrollment:* CE 3410 or CHE 2300 or ME 3080; or GEOL 4820 and either GEOL 4150 or MATH 2060.
- EES 4020* Water and Waste Treatment Systems 3 (3)** Study of fundamental principles, rational design considerations, and operational procedures of the unit operations and processes employed in water and waste treatment. Both physiochemical and biological treatment techniques are discussed. Introduces the integration of unit operations and processes into water and waste treatment systems. *Preq:* EES 2020 or EES 4010.
- EES 4100* Environmental Radiation Protection I 3 (3)** Fundamental principles of radiological health and radiation safety. Topics include radiation fundamentals, basic concepts of environmental radiation protection, internal and external dosimetry, environmental dose calculations and radiation protection standards. *Preq:* PHYS 2210 with a grade of C or better.
- EES 4110* Ionizing Radiation Detection and Measurement 3 (2)** Laboratory exercises in ionizing radiation detection and measurements. Topics include nuclear electronics; counting statistics; radiation interactions; basic gas, scintillation, and semiconductor detectors; gamma-ray spectroscopy; health physics survey instrumentation; and thermoluminescent dosimetry. *Preq:* EES 4100. *Coreq:* EES 4111.
- EES 4111* Ionizing Radiation Detection and Measurement Laboratory 0 (3)** Non-credit laboratory to accompany EES 4110. *Coreq:* EES 4110.
- EES 4120 Nuclear Fuel Cycle and Radioactive Waste Management 3 (3)** Materials flow throughout the nuclear fuel cycle emphasizing safe handling of radioactive material; environmental aspects of fuel cycle activities; radioactive waste management; nuclear nonproliferation and safeguards; nuclear forensics. *Preq:* EES 3100. *Preq or concurrent enrollment:* EES 4100.
- EES 4300* Air Pollution Engineering 3 (3)** Introductory course in air pollution and its control. Topics include air pollutants and effects, sources, dispersion models, engineering controls, and air-quality legislation. *Preq:* EES 2020 or EES 4010.
- EES 4370* Biodegradation and Bioremediation 3 (3)** Basic principles of biodegradation for major classes of organic and inorganic contaminants, including halogenated aliphatic and aromatic compounds, fuel hydrocarbons, pesticides and nitrated energetic compounds, metals, and radionuclides. The basic science of microbiology and chemistry, and how these are used to develop bioremediation strategies and technologies, are discussed. *Preq:* One of EES 2020 or EES 4010; and one of CH 2010 or CH 2230; and one of MICR 3050 or MICR 4130.
- EES 4500 Professional Seminar 1 (1)** Covers various topics related to skills and techniques for evaluating career opportunities, seeking and obtaining environmental engineering employment, career development, professional registration, professional ethics, and other factors necessary for achieving success in a professional career. Course enables students to make decisions that will help them succeed in their careers. *Preq or concurrent enrollment:* EES 3030 and EES 3040 and EES 3050 and EES 4300.
- EES (BE, FOR) 4510* Newman Seminar and Lecture Series in Natural Resources Engineering 1 (2)** Topics dealing with development and protection of land, air, water, and related resources are covered by seminar with instructor and invited lecturers. Current environmental and/or resource conservation issues are addressed. Includes Honors sections. May also be offered as BE 4510 or FOR 4510. *Preq:* Senior standing.
- EES 4750 Capstone Design Project 3 (1)** Students apply creativity and their engineering knowledge to solve open-ended environmental engineering problems. Problems are formulated and solutions are evaluated by faculty and practicing engineers. Oral and written communication skills are developed through presentations, correspondence and project reports. *Preq:* CE 3410 and EES 3030 and EES 3040 and EES 3050 and EES 4300. *Coreq:* EES 4751.
- EES 4751 Capstone Design Project Laboratory 0 (6)** Non-credit laboratory to accompany EES 4750. *Coreq:* EES 4750.
- EES 4800* Environmental Risk Assessment 3 (3)** Quantitative estimation of human health risk posed by the release of a contaminant to the environment. Topics include methods for analyzing emission rate, environmental transport, exposure, and health effects; methods of uncertainty analysis; and the role of risk assessment in environmental regulation and environmental decision making. *Preq:* EES 2020 or EES 4010; and MATH 2080 with a grade of C or better.
- EES (BE) 4840* Municipal Solid Waste Management 3 (3)** Introduction to the problems, regulations, collection, handling, recycling, and disposal of municipal solid wastes in the urban and rural sectors. Emphasizes an integrated waste-management system with resource recovery, composting, incineration, landfill disposals, and their costs. May also be offered as BE 4840. *Preq:* EES 2020 or EES 4010.
- EES 4850* Hazardous Waste Management 3 (3)** Introduction to the problems, regulations, treatment, and ultimate disposal of hazardous and toxic materials. Spill cleanup, groundwater transport, land disposal, incineration, and treatment technologies are discussed. *Preq:* EES 2020 or EES 4010; and CH 2010 or CH 2230.
- EES 4860* Environmental Sustainability 3 (3)** Topics include sustainable engineering and industrial ecology with emphasis on pollution prevention methods using source reduction, recycling assessments, treatment to reduce disposal, life-cycle assessment and design for the environment. Emphasizes case studies. *Preq:* Junior standing in College of Engineering and Science.
- EES 4900* Special Projects 1-3 (1-3)** Studies or laboratory investigations on special topics in the environmental engineering and science field. Arranged on a project basis with a maximum of individual student effort and a minimum of staff guidance. May be repeated for a maximum of three credits. Includes Honors sections. *Preq:* Consent of instructor.

EES 4910 Selected Topics in Environmental Engineering I-3 (I-3) Study of the dynamic role of environmental engineering in maintaining environmental quality. A comprehensive study of any phase of environmental engineering. May be repeated for credit, but only if different topics are covered. *Preq:* Consent of department chair.

EES 4950 Honors Thesis in Environmental Engineering I (1) Continuation of EES 4000. Students complete their honors thesis in environmental engineering and give an oral presentation of the results. *Preq:* EES 4000 and consent of instructor and membership in the Calhoun Honors College.

EXECUTIVE LEADERSHIP AND ENTREPRENEURSHIP

Associate Professors: P.T. Gianiodis, W.H. Stewart; *Assistant Professors:* A.E. Ingram, J.W. Ridge; *Lecturer:* J.E. Hopkins

ELE 3010 Introduction to Entrepreneurship 3 (3) An overview of entrepreneurship topics: opportunity creation and discovery, business concepts and business models, feasibility and business plans. Financial, managerial, legal, social and ethical issues are also addressed. *Preq:* MGT 2010.

ELE (MKT) 3140 New Venture Creation I 3 (3) First in a two-part series that continues with MGT (ELE) 3150 assessing entrepreneurial opportunities. Focuses on creativity, idea generation, market opportunity analysis, strategy, and methods of entry. Opportunity analysis may be developed into a full new venture plan in ELE 3150 or MGT 3150. May also be offered as MKT 3140. *Preq:* Junior standing.

ELE (MGT) 3150 New Venture Creation 3 (3) Through the development of a business plan, the course focuses on creating an organization capable of effectively exploiting a viable opportunity. Topics include organization strategy and design, start-up capital, operations and sourcing issues, leadership, team building, and management of rapid growth. May also be offered as MGT 3150. *Preq:* ELE 3010.

ELE (ECON) 3210 Economics of Innovation 3 (3) Examines the nature of entrepreneurship and the contribution of innovation to economic growth. Investigates the organizational and institutional sources of innovation in different firms and different countries as well as the work of economic theorists concerning the role entrepreneurs play in bringing new products to market. May also be offered as ECON 3210. *Preq:* ECON 3060 or ECON 3140.

ELE (PSYC, SOC) 3560 Social Science of Entrepreneurship 3 (3) Examines those areas of the social sciences that have direct relevance for entrepreneurs. Topics include processes by which entrepreneurs are shaped by social institutions such as the family and community, public policy implications and influences on entrepreneurship, risk perception, decision making, motivation, leadership, and group dynamics. May also be offered as PSYC 3560 or SOC 3560. *Preq:* SOC 2010 or SOC 2020 or SOC 2350 or PSYC 2010 or POSC 1010 or POSC 1020 or POSC 1040.

ELE 4000* Technology Entrepreneurship 3 (3) Introduction to technology entrepreneurship emphasizing ideation, opportunity assessment, market and technology forecasting, intellectual property protection, financial modeling and business valuation, project management, and cross-functional team building. *Preq:* Junior standing in the College of Engineering and Science.

ELE 4010 Executive Leadership and Entrepreneurship II 3 (3) Continuation of ELE 3010 with extensive use of a computer-simulated business start-up. *Preq:* ELE 3010.

ELE (AGM) 4190 Agribusiness Innovation and Entrepreneurship 3 (3) Emphasis on assessing students' abilities as agribusiness entrepreneurs, evaluating the feasibility of a business idea, creating strategies for organizing and marketing the agricultural business, exploring pricing for products or services, developing capital needs and sound financial statements, and researching, developing, and writing a comprehensive plan for the business. May also be offered as AGM 4190. *Preq:* AGM 2190 or AGM 3190 or AGRB 3020 or AGRB 3190 or MGT 2010.

ELE 4990 Executive Leadership and Entrepreneurship III 3-6 (3-6) Continuation of ELE 3010 and 4010. Directed practical study of entrepreneurship and leadership. Students work closely with external infant firms to develop new products and bring existing products to market successfully. *Preq:* ELE 4010.

ENGINEERING MECHANICS

Professors: N.M. Aziz, S.D. Schiff; *Assistant Professors:* N.B. Kaye, W. Pang, F.Y. Testik; *Senior Lecturers:* B.G. Nielson, M.M. Sternhagen

EM 2020 Engineering Mechanics: Dynamics 3 (3) Continuation of CE 2010. Principal topics are kinematics and kinetics of particles and rigid bodies of finite size. Techniques of vector mathematics are employed. Includes Honors sections. *Preq:* CE 2010 and MATH 2060.

ENGLISH

Professors: S.M. Ashton, R.E. Barfield, D. Blakesley, W.K. Chapman, S.J. Hilligoss, T.W. Howard, M.J. Jacobi, S.B. Katz, G.W. Koon, L.J. Morrissey, C.E. Paul, R.B. Palmer, V.J. Vitanza, S.D. Williams, *Chair:* A.P. Young; *Associate Professors:* J.B. Field, C.A. Hayes, J.R. Holmevik, K.S. Manganelli, K.L. Morris, E.J. Rivlin, E.K. Sparks, W. Stockton; *Assistant Professors:* C.F. Bushnell, D.S. Coombs, E.M. Goss, G. Hankins, W. Hunter, D. Mastroianni, M.L. LeMahieu, B.M. McGrath, A.M. Naimou, R.R. Thomas, A. Skrodzka-Bates, J.M. Weiss; *Visiting Professor:* S. Eisiminger; *Visiting Assistant Professors:* S.J. Lauro, J. Morgenstern, M. Schilleman; *Senior Lecturers:* A.S. Crowden, A.N. Monaghan, B.J. Ramirez; *Lecturers:* S.T. Allred, C.A. Benson, S. Cooper, D.C. Foltz, D.P. Galvin, E. Gardiner, C.C. Holmes, A.B. Katz, K. Kettnich, A.P. Kudara, M. McCarroll, A. Oberdan, K.B. Proehl, M.N. MacAlystre, W.M. Pulley, J.L. Pursley III, P.D. Randall, L. Salley, M.F. Shirley, E.A. Stansell, W.A. Stanton, N.V. Swanson, A.N. Swords, R. Wilhelm

ENGL 1010 Composition I 3 (3) Training in correct and effective expression in brief expository essays; review of the fundamentals of grammar and punctuation; instruction in common expository methods.

ENGL 1020 Composition II 3 (3) Continued emphasis on correct and effective expression; training in the organization and writing of the research report. *Preq:* ENGL 1010.

ENGL 1030 Accelerated Composition 3 (3) Training in composing correct and effective expository and argumentative essays, including writing documented essays. Students who have received credit for ENGL 1020 will not be allowed to enroll in or receive credit for ENGL 1030. Includes Honors sections. *Coreq:* ENGL 1031.

ENGL 1031 Accelerated Composition Laboratory 0 (1) Non-credit laboratory to accompany ENGL 1030. *Coreq:* ENGL 1030.

ENGL 1110 English as a Second Language 3 (3) Special course for students learning English as a second language. Intensive study and drill in American English pronunciation and listening comprehension. Required of all foreign students who do not make a satisfactory grade on screening examination in oral English. To be taken Pass/No Pass only. Carries no credit for graduation. *Coreq:* ENGL 1111.

ENGL 1111 English as a Second Language Laboratory 0 (2) Non-credit laboratory to accompany ENGL 1110. *Coreq:* ENGL 1110.

ENGL 2020 The Major Forms of Literature 3 (3) Study of the basic structures and elements of fiction, poetry, and drama, including literary and critical theory, with readings in American, British, and world literature. Proficiency in composition must be demonstrated. Includes Honors sections. *Preq:* ENGL 1030.

ENGL 2120 World Literature 3 (3) Introduction to selected works from the Americas Africa, Asia, Europe, and the Middle East from ancient to modern eras, with emphasis on major authors. Includes Honors sections. *Preq:* ENGL 1030.

ENGL 2130 British Literature 3 (3) Introduction to selected authors and major periods of the British literary tradition, from the Middle Ages to World War II, with attention to poetry, fiction, and drama. Includes Honors sections. *Preq:* ENGL 1030.

ENGL 2140 American Literature 3 (3) Introduction to selected authors and major periods of the American literary tradition from 1620 to 1945. Includes Honors sections. *Preq:* ENGL 1030.

ENGL 2150 Literature in 20th- and 21st-Century Contexts 3 (3) Introduction to major contemporary cultural movements via selected authors in 20th- and 21st-century literature, primarily American and British, with attention to poetry, fiction, and drama since World War II. Includes Honors sections. *Preq:* ENGL 1030.

ENGL 2310 Introduction to Journalism 3 (3) Instruction and practice in writing for mass media; editorial responsibilities. *Preq:* ENGL 1030.

ENGL 3000 Professional Development 2 (2) Orientation to the English major as a discipline and as a preparation for a range of careers. Introduction to and assistance with the compilation of the digital portfolio as a place to collect, synthesize and reflect on learning.

- ENGL (GW) 3010 Great Books of the Western World 3 (3)** Introduces Great Works minor. Includes readings about the Great Books concept, as well as various great books from the humanities, arts and natural and social sciences. Includes Honors sections. May also be offered as GW 3010. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 3040 Business Writing 3 (3)** Introduction to audience, context, purpose, and writing strategies for texts common in professional business settings: memoranda, letters, reports, and proposals. Includes individual and team projects. *Preq:* Junior standing.
- ENGL 3100 Critical Writing About Literature 3 (3)** Terms and techniques for literary analysis, including close reading, vocabulary for analysis, research and writing skills, casebook study of critical approaches. Discussion of poetry and genres preferred. *Preq or concurrent enrollment:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150
- ENGL 3120 Advanced Composition 3 (3)** Workshop in practical writing focusing on principles and style. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 3140 Technical Writing 3 (3)** Intensive, project-based application of principles of audience, context, purpose, and writing strategies of technical writing: proposals, reports, communication deliverables. Individual and team projects. Includes Honors sections. *Preq:* Junior standing.
- ENGL 3150 Scientific Writing and Communication 3 (3)** Study and practice of rhetorical conventions in professional scientific communication through the analysis and writing of major genres. Focuses on principles, strategies, and styles of scientific argumentation and audience adaptation in written, oral, and visual media. Intended for students majoring in the sciences. *Preq:* ENGL 1030; and BIOL 1030 or BIOL 1100; and Junior standing.
- ENGL 3320 Visual Communication 3 (3)** Hands-on survey of visual communication theories and practices used by technical communicators in business and industry environments. Class meets regularly in computer classrooms. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 3330 Writing for the News Media 3 (3)** Practical experience in gathering and writing news and feature copy for the media, preparing for an array of writing styles as demanded by the broad spectrum of print and media outlets. Examination of the modern media specialist, laws governing the profession, and journalistic ethics. *Preq:* ENGL 2310.
- ENGL 3370 Creative Inquiry: English 1-3 (1-3)** Students pursue scholarly activities individually or in teams under the direction of a faculty member. Creative Inquiry projects may be interdisciplinary. Arrangements with faculty must be established prior to registration. May be repeated for a maximum of nine credits. *Preq:* Consent of instructor.
- ENGL 3450 The Structure of Fiction 3 (3)** Introduction to the creative writing and critical study of prose fiction.
- ENGL 3460 The Structure of Poetry 3 (3)** Introduction to the creative writing and critical study of poetry.
- ENGL (THEA) 3470 The Structure of Drama 3 (3)** Introduction to the creative writing and critical study of drama. May also be offered as THEA 3470.
- ENGL 3480 The Structure of the Screenplay 3 (3)** Introduction to the creative writing and critical study of the screenplay. Screenplays vary from semester to semester. May be repeated once for credit with consent of instructor.
- ENGL 3490 Technology and the Popular Imagination 3 (3)** Examines relationship between technology and fiction and creative nonfictional texts, including print, film, and electronic media. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 3500 Mythology 3 (3)** Study of the great myths of the world emphasizing their applications to literature. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 3530 American Literatures of Race, Ethnicity and Migration 3 (3)** Examination of U.S. American literary texts that respond to the histories and competing theories of race, ethnicity, migration, empire or diaspora. May include attention to Native American, African American, Latina/o, Chicana/o, Asian American, Jewish American, and Arab American literature. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 3540 Literature of the Middle East and North Africa 3(3)** A study of literary texts of the Middle East and North Africa, with emphasis on literature originally published in languages such as Arabic, Persian, Turkish or Hebrew. Attention may be given to translation, diaspora and migration within or from the region. Conducted in English. No knowledge of foreign languages is required. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 3550 Global Studies in Popular Culture 3 (3)** Examination of the nature, functions, history, and effect of global culture upon societies throughout our digitally connected world of various media, such as best sellers, popular magazines, television, movies, Internet, gaming platforms, and emerging electronic genres. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 3560 Science Fiction 3 (3)** Readings in science fiction from the 17th century to the present, with special emphasis on writers since Verne and Wells. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 3570 Film 3 (2)** Examination of the film medium as an art form: its history, how films are made, why certain types of films (western, horror movies, etc.) have become popular, and how critical theories provide standards for judging film. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150. *Coreq:* ENGL 3571.
- ENGL 3571 Film Laboratory 0 (3)** Non-credit laboratory to accompany ENGL 3570. *Coreq:* ENGL 3570.
- ENGL 3670 Special Topics for Honors Students 3 (3)** Varied topics of general interest in literature, language, rhetoric, or culture for all honors students. Specific topics announced each semester. May be repeated for a maximum of nine credits. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 3800 British and American Women Writers 3 (3)** Poetry, drama, fiction, and prose by established and little-known women writers in Britain and America. Particular attention to works treating themes and issues concerning women's lives. Readings on such topics as women and work, education, religion, creativity. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 3850 Childrens Literature 3 (3)** Reading and analysis in a wide range of authors, illustrators, and genres appropriate for children from preschool through eighth grade, classic as well as modern. Critical approaches include historical, thematic, and social. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 3860 Adolescent Literature 3 (3)** Reading and analysis of literature written for readers age 12-18. Emphasis is on historical context, chief themes and motifs, and censorship issues, as well as connections with classic literature. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 3960 British Literature Survey I 3 (3)** Examines key texts in British literature to 1789. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 3970 British Literature Survey II 3 (3)** Examines key texts of British literature from 1789 to the present. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 3980 American Literature Survey I 3 (3)** Examines key texts of American literature from beginnings of European settlement to the Civil War in historical context. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 3990 American Literature Survey II 3 (3)** Examines key texts of American literature from the Civil War to the present in historical context. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 4000* The English Language 3 (3)** Studies in English usage and historical development of the language. *Preq:* ENGL 3100.
- ENGL 4010* Grammar Survey 3 (3)** Survey of modern grammars with a focus on exploring the impact structural grammar has had on traditional grammar. Recommended for English teachers. *Preq:* ENGL 3100.
- ENGL 4030 The Classics in Translation 3 (3)** Examination of Homer's Iliad and Odyssey, Virgil's Aeneid, and Ovid's Metamorphoses. A few shorter works by other Greek and Roman writers may also be read. *Preq:* ENGL 3100.
- ENGL 4070* The Medieval Period 3 (3)** Selected works of Old and Middle English literature, exclusive of Chaucer. *Preq:* ENGL 3100.
- ENGL 4080* Chaucer 3 (3)** Selected readings in Middle English from The Canterbury Tales and other works by Chaucer. *Preq:* ENGL 3100.
- ENGL 4100* Drama of English Renaissance 3 (3)** Selected readings in non-Shakespearean dramatic literature of the 16th and 17th centuries. *Preq:* ENGL 3100.
- ENGL 4110* Shakespeare 3 (3)** Study of selected tragedies, comedies, and history plays of Shakespeare. Required of all English majors. *Preq or concurrent enrollment:* ENGL 3100

- ENGL 4140 Milton 3 (3)** Development of Milton's art and thought from the minor poems and selected prose through *Paradise Lost*, *Paradise Regained*, and *Samson Agonistes*, set against the background of the late Renaissance. *Preq:* ENGL 3100.
- ENGL 4150* The Restoration and Eighteenth Century 3 (3)** Readings in Dryden, Swift, Pope, and Dr. Johnson. *Preq:* ENGL 3100.
- ENGL 4160* The Romantic Period 3 (3)** Readings from the poetry and critical prose of Blake, Wordsworth, Coleridge, Byron, Shelley, Keats, and other representative figures. *Preq:* ENGL 3100.
- ENGL 4170* The Victorian Period 3 (3)** Reading from the poetry and nonfiction prose of selected Victorian authors, including works of Carlyle, Tennyson, Browning, Arnold, and other representative figures. *Preq:* ENGL 3100.
- ENGL 4180* The English Novel 3 (3)** Study of the English novel from its 18th century beginnings through the Victorian Period. *Preq:* ENGL 3100.
- ENGL 4190* Postcolonial and World Literatures 3 (3)** Selected readings in post-colonial literature and theory, focusing on issues of nationalism, migration, resistance, race, language, and master narratives. *Preq:* ENGL 3100.
- ENGL 4200* American Literature to 1799 3 (3)** Focused study of authors, movements, themes, critical approaches, and genres in literature of colonial and early national America from early European explorations of the continent to 1799. *Preq:* ENGL 3100.
- ENGL 4210* American Literature from 1800 to 1899 3 (3)** Focused study of authors, movements, themes, critical approaches, and genres in the poetry and prose of major American authors and literary movements from the nineteenth century. *Preq:* ENGL 3100.
- ENGL 4220 Topics in Writing Poetry 3 (3)** Examines the craft, technique and/or formal choices of one or more contemporary poets. Emphasizes the practice of writing poetry. *Preq:* ENGL 3450 or ENGL 3460 or ENGL 3470 or ENGL 3480.
- ENGL 4230 Topics in Writing Fiction 3 (3)** Examines the craft, technique and stylistic choices of one or more contemporary fiction writers. Emphasizes the practice of writing fiction. *Preq:* ENGL 3450 or ENGL 3460 or ENGL 3470 or ENGL 3480.
- ENGL 4250* The American Novel 3 (3)** Survey of the most significant forms and themes of the American novel from its beginnings to 1900. *Preq:* ENGL 3100.
- ENGL 4260* Southern Literature 3 (3)** Intellectual and literary achievement of the South from 1607 to the present, with emphasis on the writers of the 19th century. *Preq:* ENGL 3100.
- ENGL 4280* Contemporary Literature 3 (3)** Focuses on American, British, and other fiction, poetry, and drama from Post-World War II to the present. *Preq:* ENGL 3100.
- ENGL (THEA) 4290 Dramatic Literature I 3 (3)** Selected reading in the dramatic literature from the classical era of Greece and Rome to the Renaissance. May also be offered as THEA 4290. *Preq:* ENGL 3100.
- ENGL (THEA) 4300* Dramatic Literature II 3 (3)** Principles and progress of drama from the Restoration to the present; analysis of representative plays; critical reports; discussion of trends in dramatic literature. May also be offered as THEA 4300. *Preq:* ENGL 3100.
- ENGL 4310* Modern Poetry 3 (3)** The modern tradition in English and American poetry from Yeats to the present; relevant critical essays. *Preq:* ENGL 3100.
- ENGL 4320* Modern Fiction 3 (3)** American and British novels and short stories of the 20th century. *Preq:* ENGL 3100.
- ENGL 4330* The Anglo-Irish Literary Tradition 3 (3)** Exploration of the unique literary heritage and achievement of English-language Irish writers in the 19th and 20th centuries. Major figures of the Irish tradition: W. B. Yeats, James Joyce, Samuel Beckett, and other writers; consideration of the specifically Irish aspects of their works. *Preq:* ENGL 3100.
- ENGL 4340* Environmental Literature 3 (3)** Survey of literature that examines the relationship between human beings and the natural world, including analysis of environmental themes in myths and legends and in selected poetry and prose of 19th and 20th-century England and America. *Preq:* ENGL 3100.
- ENGL 4350* Literary Criticism 3 (3)** Major critical approaches to literature. *Preq:* ENGL 3100.
- ENGL (WS) 4360* Feminist Literary Criticism 3 (3)** Introduces the germinal works of feminist literary theory and criticism. Outlines the development of modern literary criticism by studying feminist versions of the major critical methodologies. May also be offered as WS 4360. *Preq:* ENGL 3100.
- ENGL 4370* Directed Studies 1-3 (1-3)** Class and tutorial work for students with special interests or projects in American, British, or European literature outside the scope of existing courses. Applications must be approved during the registration period of the semester preceding the one in which directed studies will occur. May be repeated by arrangement with the department. *Preq:* ENGL 3100.
- ENGL 4380 Departmental Honors Research 3 (3)** Research for the preparation of an honors project. *Preq:* ENGL 3100.
- ENGL 4390 Departmental Honors Project 3 (3)** Preparation of an honors project. *Preq:* ENGL 3100.
- ENGL 4400* Literary Theory 3 (3)** Examination of how approaches such as Marxism, Psychoanalysis, Feminism, Deconstruction, New Historicism, Post-Colonialism, Cultural Studies, and Queer Theory answer the question, "What is literature?" *Preq:* ENGL 3100.
- ENGL 4410* Literary Editing 3 (3)** Examination of how the theories and practices of editing construct texts, stressing the problems and objectives of editing and providing practical experience with literary editing. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 4420* Cultural Studies 3 (3)** Investigation of the similarities and connections between a wide variety of cultural products, events, and practices - from fast food to opera to online shopping - using theories ranging from Marxism to hybridity. *Preq:* ENGL 3100.
- ENGL 4430 Theories of World Literature 3 (3)** Examination of the historical and contemporary theories of world literature, including theories of worldliness, planetarity, globalism, and late capitalism. These theories are used in pursuit of world literature on a worldwide and planetary scale. *Preq:* ENGL 3100.
- ENGL 4440* Renaissance Literature 3 (3)** Selected readings in non-Shakespearean British literature from 1500-1660. Includes drama, poetry, and prose. *Preq:* ENGL 3100.
- ENGL 4450* Fiction Workshop 3 (3)** Workshop in the creative writing of prose fiction. May be repeated once for credit. *Preq:* ENGL 3450.
- ENGL 4460* Poetry Workshop 3 (3)** Workshop in the creative writing of poetry. May be repeated once for credit. *Preq:* ENGL 3460.
- ENGL (THEA) 4470* Playwriting Workshop 3 (3)** Workshop in the creative writing of plays. May be repeated once. May also be offered as THEA 4470. *Preq:* ENGL 3470 or THEA 3470.
- ENGL 4480* Screenwriting Workshop 3 (3)** Workshop in the creative writing of screenplays. May be repeated once for credit. *Preq:* ENGL 3480.
- ENGL 4490* Creative Non-Fiction 3 (3)** Advanced workshop in writing non-fiction prose for magazine and free-lance markets. *Preq:* ENGL 3450 or ENGL 3460.
- ENGL 4500* Film Genres 3 (2)** Advanced study of films that have similar subjects, themes, and techniques, including such genres as the Western, horror, gangster, science fiction, musical, and/or screwball comedy. Also considers nontraditional genres, screen irony, genre theory, and historical evolution of genres. Topics vary. *Preq:* ENGL 3570. *Coreq:* ENGL 4501.
- ENGL 4501* Film Genres Laboratory 0 (3)** Non-credit laboratory to accompany ENGL 4500. *Coreq:* ENGL 4500.
- ENGL (COMM) 4510 Film Theory and Criticism 3 (2)** Advanced study into the theory of film/video making emphasizing understanding a variety of critical methods to approach a film. Examines the history of film theory and defines the many schools of film criticism, including realism, formalism, feminism, semiotics, Marxism, and expressionism. May also be offered as COMM 4510. *Preq:* ENGL 3570. *Coreq:* ENGL 4511.
- ENGL (COMM) 4511* Film Theory and Criticism Laboratory 0 (3)** Non-credit laboratory to accompany ENGL 4510. May also be offered as COMM 4511. *Coreq:* ENGL 4510.
- ENGL 4520* Great Directors 3 (2)** Intensive study of one to three film directors emphasizing understanding the entire canon of each director. Students study similarities in techniques, shifts in thematic emphasis, and critical methodologies for approaching the works of each director. Topics vary. *Preq:* ENGL 3570. *Coreq:* ENGL 4521.
- ENGL 4521* Great Directors Laboratory 0 (3)** Non-credit laboratory to accompany ENGL 4520. *Coreq:* ENGL 4520.

- ENGL 4530* Sexuality and the Cinema 3 (2)** Examination of male/female sexual roles and their evolution in American genre films, avant-garde cinema, and international films. Includes the study of movies in relation to cultural values and social stereotypes, introduction to feminist film theory, and consideration of film pornography. *Preq:* ENGL 3570. *Coreq:* ENGL 4531.
- ENGL 4531* Sexuality and the Cinema Laboratory 0 (3)** Non-credit laboratory to accompany ENGL 4530. *Coreq:* ENGL 4530.
- ENGL (LANG) 4540 Selected Topics in International Film 3 (2)** Presents subtitled films of specific world cultures and basic film theory and discourse applicable to the selected areas. Taught in English. May be repeated for a maximum of six credits with consent of department chair. May also be offered as LANG 4540. *Preq:* ENGL 3100. *Coreq:* ENGL 4541.
- ENGL (LANG) 4541 Selected Topics in International Film Laboratory 0 (3)** Non-credit laboratory to accompany ENGL 4540. May also be offered as LANG 4541. *Coreq:* ENGL 4540.
- ENGL 4550* American Humor 3 (3)** Native American humor of the 19th and 20th centuries. *Preq:* ENGL 3100.
- ENGL (HUM) 4560* Literature and Arts of the Holocaust 3 (3)** Addresses the Holocaust through literature, art, architecture, music, and film. Beginning with historical, political, and economic forces that contributed to the Holocaust, course then focuses on highly diverse creative responses to this event - responses that often reflect the difficulties and politics of these commemorative gestures. May also be offered as HUM 4560. *Preq:* ENGL 3100.
- ENGL 4590* Special Topics in Language, Criticism, Theory 3 (3)** Advanced studies in topics not central to other English courses, such as certain authors, works, genres, themes, or areas of knowledge and culture. Specific topics are announced when offered. May be repeated once for credit with department chair's consent. *Preq:* ENGL 3100.
- ENGL 4600* Issues in Writing Technologies 3 (3)** Examines writing technologies from different historical periods. Investigates how writing is understood, circulated, legislated, and protected in terms of its production technology. *Preq:* ENGL 3100; and ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.
- ENGL 4630* Topics in Literature to 1699 3 (3)** Selected readings in literature from antiquity through the 17th century for focused study of authors, movements, themes, critical approaches, and genres. Topics vary and are constructed by individual faculty. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* ENGL 3100.
- ENGL 4640* Topics in Literature from 1700 to 1899 3 (3)** Selected readings in 18th- and 19th-century literature for focused study of authors, movements, themes, critical approaches, and genres. Special topics vary and are constructed by individual faculty. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* ENGL 3100.
- ENGL 4650* Topics in Literature from 1900 3 (3)** Selected readings in 20th- and 21st-century literature for focused study of authors, movements, themes, critical approaches, and genres. Topics vary and are constructed by individual faculty. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* ENGL 3100.
- ENGL 4750* Writing for Electronic Media 3 (3)** Workshop in new forms of writing and hypertextual design for interactive electronic media, including social networks, online and video communities. May be repeated once for credit at the undergraduate level. *Preq:* ENGL 3100.
- ENGL 4780* Digital Literacy 3 (3)** Examines how technology has expanded ideas of literacies and texts. Includes reading, studying and analyzing print and digital texts to determine how digital techniques change patterns of reading and how readers make sense of electronic texts. *Preq:* ENGL 3100.
- ENGL 4820* African American Literature to 1920 3 (3)** Critical examination of the development of the African American literary tradition from the Colonial Period to the Harlem Renaissance. Considers the historical and cultural contexts of a variety of texts, themes and theories. *Preq:* ENGL 3100.
- ENGL 4830* African American Literature from 1920 to the Present 3 (3)** Critical examination of the development of the African American literary tradition from the Harlem Renaissance to the present. Considers historical and cultural contexts of a variety of texts, themes, theories and literary movements. *Preq:* ENGL 3100.
- ENGL (EDSC) 4850* Composition and Language Studies for Teachers 3 (3)** Examines the principles and practices of composing and teaching composition. Includes a historical study of English language with attention to phonology, morphology, syntax, semantics, and practical aspects of language grammars. Serves as a practicum in composing and assessing processes, collaborative learning, writers purposes, audience expectations, and language conventions. May also be offered as EDSC 4850. *Preq:* ENGL 3100.
- ENGL 4870* Topics in Book History 3 (3)** Examines the material and theoretical constructions of the book. Covers both historical and contemporary dimensions of dissemination, reception, artistry, and influence of books. *Preq:* ENGL 1030.
- ENGL 4880* Genre and Activity Theory 3 (3)** Examination of the forms that texts take, of the print and digital media in which they are composed, and of the ways they circulate among experts, in the public, and around the world. *Preq:* Junior standing.
- ENGL 4890* Special Topics in Writing and Publication Studies 3 (3)** Selected readings from topics in writing and publication studies, emphasizing areas such as major theories, practices, research, and critical approaches. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* ENGL 3100.
- ENGL 4900* Advanced Technical and Business Writing 3 (3)** Advanced work in writing proposals, manuals, reports and publishable articles. Client-based and collaborative writing. *Preq:* ENGL 3040 or ENGL 3140.
- ENGL (COMM) 4910* Classical Rhetoric 3 (3)** Traces the development of rhetoric from Protogoras through Isocrates, Plato, Aristotle, Cicero and Quintillian and considers questions essential to understanding persuasive theory and practices. May also be offered as COMM 4910. *Preq:* ENGL 3100.
- ENGL (COMM) 4920* Modern Rhetoric 3 (3)** Examines the new rhetorics of the 20th century, which are grounded in classical rhetoric but include findings from biology, psychology, linguistics and anthropology, among other disciplines. May also be offered as COMM 4920. *Preq:* ENGL 3100.
- ENGL 4940* Writing About Science 3 (3)** Advanced work in scientific writing and editing for peer and lay audiences. *Preq:* ENGL 3100.
- ENGL 4950* Technical Editing 3 (3)** Practical experience in editing and preparing technical manuscripts for publication. General introduction to the functions of the technical editor. *Preq:* ENGL 3140.
- ENGL 4960 Senior Seminar 3 (3)** Capstone course requiring participation and a substantial essay, allowing graduating English majors the chance to work closely with faculty and other English majors on a special topic in the advanced study of literature, rhetoric, writing, and/or publication studies. *Preq:* ENGL 3100 and Senior standing in English.
- ENGL 4980* Writing Center Theory and Practice 3 (3)** Preparation for students to work in the Clemson University Writing Center. Required of all undergraduate Writing Fellows. *Preq:* Sophomore standing and consent of instructor. *Coreq:* ENGL 4981.
- ENGL 4981* Writing Center Theory and Practice Laboratory 0 (1)** Non-credit laboratory to accompany ENGL 4980. *Coreq:* ENGL 4980.
- ENGL 4990 Practicum in Writing 0-3 (0-3)** Students apply their knowledge of concepts and principles to a substantive project involving writing, editing and/or publication activities. Emphasis is on practical experience in print, digital and online forums for academic, private or public readership. To be taken Pass/No Pass only. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150; and Junior standing.

ENGINEERING

Associate Professor: W.J. Park, R.J. Watkins Jr., *Chair*;
Senior Lecturers: S.C. Brandon, J.C. Minor, E.A. Stephan, N. Yasmin; *Lecturers:* D.J. Ewing, S.J. Grigg, J.R. Maier, W.D. Martin

ENGR 1000 Major Discovery Seminar 1 (1) Introduction to the engineering majors offered by Clemson University. Also includes information about the engineering profession, best student practices and potential career paths. Invited presenters and faculty provide lectures and demonstrations. To be taken Pass/No Pass only.

- ENGR 1020 Engineering Disciplines and Skills 2 (1)** Provides solid foundation of skills to solve engineering problems. Students demonstrate problem solving techniques with spreadsheets, dimensions and units; use modeling techniques and interpret validity of experimental results. Students design projects on multi-discipline teams. Introduces professional and societal issues appropriate to engineering. Various forms of technical communication are emphasized. Includes Honors sections. *Prq:* Score of 65 or better on the Clemson Mathematics Placement Test (CMPT). *Coreq:* ENGR 1021.
- ENGR 1021 Engineering Disciplines and Skills Laboratory 0 (2)** Non-credit laboratory to accompany ENGR 1020. *Coreq:* ENGR 1020.
- ENGR 1050 Engineering Discipline and Skills I 1 (2)** Provides solid foundation of skills to solve engineering problems. Students demonstrate problem solving techniques with spreadsheets, dimensions and units. Introduces professional and societal issues appropriate to engineering. Includes Honors sections. *Prq:* MATH 1050; or MATH 1060 or MATH 1070 with a C or better; or a score of 65 or higher on the Clemson Mathematics Placement Test (CMPT).
- ENGR 1060 Engineering Discipline and Skills II 1 (2)** Continuation of topics introduced in ENGR 1050. Students demonstrate problem solving techniques using spreadsheet and modeling techniques, and by interpreting validity of experimental results. Students complete projects on multi-discipline teams. Various forms of technical communication are emphasized. Includes Honors sections. *Prq:* ENGR 1050 with a C or better.
- ENGR 1070 Programming and Problem Solving I 1 (2)** Students formulate and solve engineering problems using MATLAB: estimate answers for comparison to computed solutions; read, interpret and write programs, instructions and output (both written and graphical); and debug. Includes Honors sections. *Prq or concurrent enrollment:* ENGR 1060 with a C or better.
- ENGR 1080 Programming and Problem Solving II 1 (2)** Continuation of topics introduced in ENGR 1070. Students formulate and solve engineering problems using MATLAB; read, interpret and write programs; utilize trendlines; iterate/loops; evaluate and compose conditional statements; and debug. Includes Honors sections. *Prq:* ENGR 1060 and ENGR 1070 each with a C or better.
- ENGR 1090 Programming and Problem Solving Applications 1 (2)** Students formulate and solve engineering problems on multi-discipline teams using MATLAB. Various forms of technical communication are emphasized. Includes Honors sections. *Prq or concurrent enrollment:* ENGR 1080 with a C or better.
- ENGR 1150 Engineering Design and Modeling 3 (2)** Introduction to engineering graphics and machine design. Students use hand sketching and CAD tools to visualize, communicate, rapid prototype, and analyze engineering problems. SOLIDWORKS software is used. Credit toward a degree will be given for only one of ENGR 1150, 1160, 2080, 2090 or 2100. *Coreq:* ENGR 1151.
- ENGR 1151 Engineering Design and Modeling Laboratory 0 (2)** Non-credit laboratory to accompany ENGR 1150. *Coreq:* ENGR 1150.
- ENGR 1160 Engineering Graphics and Computer-Aided Design 3 (2)** Students use 2-D and 3-D drawings to visualize and analyze engineering problems. 2-D applications include site plans, contour maps, watershed, floodplains, road design, and architectural drawings. 3-D applications include models, orthographic views, and rapid prototype. Credit toward a degree will be given for only one of ENGR 1150, 1160, 2080, 2090 or 2100. *Coreq:* ENGR 1161.
- ENGR 1161 Engineering Graphics and Computer Aided Design Laboratory 0 (2)** Non-credit laboratory to accompany ENGR 1160. *Coreq:* ENGR 1160.
- ENGR 1300 Engineering Fundamentals 2 (1)** Students formulate and solve engineering problems using advanced spreadsheet applications, dimensional analysis, graphical representation of various physical phenomena, mathematical models and statistics. Various forms of technical communication are emphasized. Credit toward a degree will be given for only one of ENGR 1300 or 1410. *Prq:* ENGR 1060. *Prq or concurrent enrollment:* MATH 1060 or MATH 1070. *Coreq:* ENGR 1301.
- ENGR 1301 Engineering Fundamentals Laboratory 0 (2)** Non-credit laboratory to accompany ENGR 1300. *Coreq:* ENGR 1300.
- ENGR 1410 Programming and Problem Solving 3 (2)** Students formulate and solve engineering problems using MATLAB; estimate answers for comparison to computed solutions; read, interpret and write programs, instructions and output; iterate, evaluate conditional statements; and debug. Various forms of technical communication are emphasized. Credit toward a degree will be given for only one of ENGR 1300 or ENGR 1410. Includes Honors sections. *Prq:* ENGR 1020 with a C or better; or *prq or concurrent enrollment:* ENGR 1060 with a C or better. *Coreq:* ENGR 1411.
- ENGR 1411 Programming and Problem Solving Laboratory 0 (2)** Non-credit laboratory to accompany ENGR 1410. *Coreq:* ENGR 1410.
- ENGR 1490 Introduction to Engineering 2 (2)** Introduction to the engineering profession and engineering disciplines, highlighting the industries based in South Carolina, for the purpose of assisting students in their selection of an engineering major. Professional, ethical and societal issues appropriate to engineering are introduced. Various forms of technical communication are emphasized.
- ENGR 1510 Engineering Skills 2 (1)** Provides students a solid foundation of skills for solving engineering problems. Students demonstrate problem solving techniques with dimensions and units, use modeling techniques, and interpret a variety of experimental results. Students also design projects on multi-discipline teams. *Coreq:* ENGR 1511.
- ENGR 1511 Engineering Skills Laboratory 0 (2)** Non-credit laboratory to accompany ENGR 1510. *Coreq:* ENGR 1510.
- ENGR 1520 Engineering Computer Skills 2 (1)** Continuation of ENGR 1510. Students demonstrate problem solving techniques using modeling and by interpreting validity of experimental results using computer software Microsoft Excel and MATLAB. Course focuses on algorithms; estimation of answers; and reading, interpreting and writing instructions in both Excel and MATAB; and provides introduction to matrices. *Prq:* ENGR 1510 with a C or better. *Coreq:* ENGR 1521.
- ENGR 1521 Engineering Computer Skills Laboratory 0 (2)** Non-credit laboratory to accompany ENGR 1520. *Coreq:* ENGR 1520.
- ENGR 1530 Engineering Foundation Skills 4 (3)** Students gain a solid foundation of skills to solve engineering problems. Students demonstrate problem solving techniques with dimensions and units using modeling, interpreting experimental results, using Microsoft Excel and MATLAB. This course focuses on algorithms; estimation of answers; and reading, interpreting and writing instructions in both Excel and MATLAB; and provides an introduction to matrices. *Coreq:* ENGR 1531.
- ENGR 1531 Engineering Foundation Skills Laboratory 0 (2)** Non-credit laboratory to accompany ENGR 1530. *Coreq:* ENGR 1530.
- ENGR 1640 Engineering MATLAB Programming 3 (2)** Continuation of topics introduced in ENGR 1520 or 1530. Students formulate and solve engineering problems using MATLAB. Coverage includes conditional statements, iteration, and recursion using looping structures. Students formulate and solve engineering problems on multi-discipline teams using MATLAB. Various forms of technical communication are emphasized. *Prq:* ENGR 1520 or ENGR 1530 with a C or better. *Coreq:* ENGR 1641.
- ENGR 1641 Engineering MATLAB Programming Laboratory 0 (2)** Non-credit laboratory to accompany ENGR 1640. *Coreq:* ENGR 1640.
- ENGR 1900 Special Projects in Engineering I 1-3 (1-3)** Individual or group projects in engineering. Projects may be interdisciplinary in nature and may involve analysis, design, and/or implementation. Instruction in use of necessary tools and test equipment is included when appropriate. May be repeated for a maximum of six credits. Includes Honors sections. *Prq:* Consent of instructor.
- ENGR 2080 Engineering Graphics and Machine Design 2 (1)** Introduction to engineering graphics and machine design. Sketching and CAD tools are used to visualize, communicate, rapid prototype and analyze engineering problems. Credit toward a degree will be given for only one of ENGR 1150, 1160, 2080, 2090, or 2100. Includes Honors sections. *Prq or concurrent enrollment for Honors students:* ENGR 1410 and MATH 1080. *Coreq:* ENGR 2081.
- ENGR 2081 Engineering Graphics and Machine Design Laboratory 0 (2)** Non-credit laboratory to accompany ENGR 2080. *Coreq:* ENGR 2080.
- ENGR 2090 Introduction to Engineering/Computer Graphics 2 (1)** Introduction to engineering graphics principles. Sketching and CAD tools are used to visualize, communicate, and perform graphical analysis of engineering problems. Credit toward a degree will be given for only one of ENGR 1150, 1160, 2080, 2090, or 2100. *Coreq:* ENGR 2091.
- ENGR 2091 Introduction to Engineering/Computer Graphics Laboratory 0 (3)** Non-credit laboratory to accompany ENGR 2090. *Coreq:* ENGR 2090.

ENGR 2100 Computer-Aided Design and Engineering Applications 2 (1) Introduction to graphics applications for engineering and related professions. 2-D and 3-D drawings are used to visualize, communicate, rapid prototype and analyze engineering problems. Engineering applications include site plans, contour plots, grading, and architectural, transportation and hydrology drawings. Credit toward a degree will be given for only one of ENGR 1150, 1160, 2080, 2090, or 2100. Includes honors sections. *Coreq:* ENGR 2101.

ENGR 2101 Computer-Aided Design and Engineering Applications Laboratory 0 (2) Non-credit laboratory to accompany ENGR 2100. *Coreq:* ENGR 2100.

ENGR 2200 Evaluating Innovations: Fixtures, Fads and Flops 3 (3) Introduces foundational theories used to critically analyze the success of consumer products and other technological innovations. Case studies are utilized to exhibit the interactions between innovation and society. Critical thinking skills are emphasized.

ENGR 2900 Special Projects in Engineering II 1-3 (1-3) Individual or group projects in engineering. Projects may be interdisciplinary in nature and may involve analysis, design, and/or implementation. Instruction in use of necessary tools and test equipment is included when appropriate. May be repeated for a maximum of six credits. Includes Honors sections. *Preq:* Sophomore standing and consent of instructor.

ENGR 3900 Special Projects in Engineering III 1-3 (1-3) Individual or group projects in engineering. Projects may be interdisciplinary in nature and may involve analysis, design, and/or implementation. Instruction in use of necessary tools and test equipment is included when appropriate. May be repeated for a maximum of six credits. Includes Honors sections. *Preq:* Junior standing and consent of instructor.

ENGR 4900 Special Projects in Engineering IV 1-3 (1-3) Individual or group projects in engineering. Projects may be interdisciplinary in nature and may involve analysis, design, and/or implementation. Instruction in use of necessary tools and test equipment is included when appropriate. May be repeated for a maximum of six credits. Includes Honors sections. *Preq:* Senior standing and consent of instructor.

ENVIRONMENTAL AND NATURAL RESOURCES

Professors: M. Espey, J.D. Lanham, P.A. Layton, T. Straka; *Associate Professors:* R.F. Baldwin, L. Gering, A. Johnson, C.J. Post, S.R. Templeton; *Assistant Professors:* K. Barrett, J. Jachowski; *Lecturer:* J. Davis

ENR 1010 Introduction to Environmental and Natural Resources I 1 (1) Informative overview of environmental and natural resources and their impact on society. Education and career opportunities are emphasized.

ENR 1020 Introduction to Environmental and Natural Resources II 1 (1) Survey of environmental and natural resource topics in the news and in primary literature. Emphasis is placed on learning to research and interpret scientific information. Aspects of technical writing and career development are also explored.

ENR 3020 Natural Resources Measurements 3 (2) Introduction to measurements of natural resources including land, vegetation, animal habitat, water quality and quantity, climate, and recreation. Remote sensing techniques are also introduced. May not be taken for credit by Forest Resource Management majors. *Preq or concurrent enrollment:* STAT 2300. *Coreq:* ENR 3021.

ENR 3021 Natural Resources Measurements Laboratory 0 (3) Non-credit laboratory to accompany ENR 3020. *Coreq:* ENR 3020.

ENR 3120 Environmental Risks and Society 3 (3) Examines the perception, analysis and management of natural and technological risks in modern society, such as how society responds to natural or human-caused disasters and global environmental challenges; and the roles of experts, the government and the general public. Case studies foster debate and critical analysis of controversial issues. *Preq:* Junior standing. Students must have completed the General Education mathematics requirement.

ENR (BIOL) 4130* Restoration Ecology 3 (3) Applies ecological principles to the restoration of disturbed terrestrial, wetland, and aquatic ecosystems. Includes the restoration of soils and waterways, of flora and fauna, and of natural ecological processes such as plant succession and nutrient cycling. May also be offered as BIOL 4130. *Preq:* BIOL 3130 or BIOL 4410 or WFB 3130.

ENR (FOR) 4160* Forest Policy and Administration 3 (3) Introduction to the development, principles, and legal provisions of forest policy in the United States and an examination of administrative and executive management in forestry. May also be offered as FOR 4160.

ENR 4290* Environmental Law and Policy 3 (3) Develops an understanding of the three branches of government that affect and dictate use and protection of natural resources. Attention is given to major federal environmental statutes. Includes examination of how policy is developed, implemented, and evaluated in the public and private sectors. *Preq:* Junior standing.

ENR (FOR) 4340* Geographic Information Systems for Natural Resources 3 (2) Develops competence in geographic information systems (GIS) technology and its application to various spatial analysis problems in natural resources. Topics include data development and management, spatial analysis techniques, critical review of GIS applications, needs analysis and institutional context. GIS hardware and software, hands-on application. Credit may be received for only one of ENR 4340 or FOR 4340. May also be offered as FOR 4340. *Coreq:* ENR 4341.

ENR (FOR) 4341* Geographic Information Systems for Natural Resources Laboratory 0 (3) Non-credit laboratory to accompany ENR 4340. May also be offered as FOR 4341. *Coreq:* ENR 4340.

ENR 4500* Conservation Issues 3 (3) Interactive study and discussion of issues related to the conservation of natural resources, emphasizing current issues in the conservation of biodiversity, identification of conflicting issues between consumptive and nonconsumptive resource management, and development of viable solutions for conservation of natural resources. *Preq:* BIOL 3130 or WFB 3130.

ENVIRONMENTAL SCIENCE AND POLICY

Associate Professor: E.R. Carraway; *Lecturers:* S. Brame, M. Nammouz, M.L. Thompson

ENSP (GEOL) 1250 Sustainable Resource Use 3 (3) This course explores the challenges our society faces in making the transition to renewable resource use in a way that is truly sustainable environmentally, economically and socially. The conflicting demands of each system will be examined and used to critically examine possible solutions using a systems based approach. May also be offered as GEOL 1250.

ENSP 2000 Introduction to Environmental Science 3 (3) Basic principles of environmental science, including ecology, energy, resources, waste management; and air, water, and soil pollution. Consideration of issues, specific cases, investigative approaches, and remedial actions. *Preq or concurrent enrollment:* Any course that satisfies the Natural Science with a Lab General Education requirement. See the *Undergraduate Announcements* for current listing of courses.

ENSP 2010 Introduction to Environmental Science for Education Majors 3 (3) Introduction to basic principles of environmental science, including physical science of the environment, energy, resources, waste management, and air and water pollution. Emphasizes the practical applications to demonstrations and activities appropriate for the elementary school classroom. Credit toward a degree will be given for only one of ENSP 2000 and ENSP 2010. *Preq:* BIOL 1090 and PHSC 1170 and PHSC 1180. *Preq or concurrent enrollment:* MATH 3160.

ENSP (PES) 3150 Environment and Agriculture 3 (3) Survey of the interrelationships of the environment and current agriculture and agricultural practices to include both the environmental impacts of agriculture and the role of agriculture in conservation and improving the environment. Includes Honors sections. May also be offered as PES 3150. *Preq:* Sophomore standing and one of the following combinations: BIOL 1040 and BIOL 1060; or BIOL 1100 and BIOL 1110; or CH 1010 and CH 1020; or CH 1050 and CH 1060.

ENSP 4000 Studies in Environmental Science 3 (3) Study of historical perspectives, attitudes, and government policy within the framework of environmental case studies to illustrate the interaction between human and natural factors as they mutually affect the environment and man's ability to deal with that environment. *Preq:* ENSP 2000 or EES 2020.

ENSP 4720* Environmental Planning and Control 2 (2) Application of planning and control to effective environmental quality improvement. Considers water supply and treatment, wastewater treatment and disposal, solid waste disposal, air pollution abatement, and land use and zoning from the standpoint of control. Not intended for graduate students in engineering. *Preq:* Consent of instructor.

ENTOMOLOGY

Professors: P.H. Adler, R.G. Bellinger, E.P. Benson, M.S. Caterino, J.D. Culin, P.A. Zungoli; *Associate Professor:* M.W. Turnbull

ENT 2000 Six-Legged Science 3 (3) Introduction to insects, their various relationships with humans, other animals, and plants. The general nature of this course makes it beneficial to all students regardless of specialty. Not open to students who have received credit for ENT 3010 or equivalent.

ENT 2010 Selected Topics 1 (1) Discussion course covering topics dealing with insects and related arthropods. Subjects are chosen to reflect issues of current interest as well as those having significance in human history. May be repeated for a maximum of three credits.

ENT 3000 Environmental Entomology 3 (3) Exploration of diversity and roles of insects in natural and affected environments, impact of insects and pesticides on environmental quality, and discussion of environmental ethics in entomological science. *Preq:* BIOL 1030 or BIOL 1040.

ENT 3010 Insect Biology and Diversity 4 (3) Introduction to the study of insects, with emphasis on their structure, function, ecology, and behavior. Identification of commonly encountered species is highlighted. Relationships between insect and human populations are discussed. Control technologies are introduced, with emphasis on environmentally responsible tactics. Offered fall semester only. *Coreq:* ENT 3011.

ENT 3011 Insect Biology and Diversity Laboratory 0 (3) Non-credit laboratory to accompany ENT 3010. *Coreq:* ENT 3010.

ENT 3080 Apiculture 3 (2) Detailed study of the honey bee and its economic importance in pollination and honey production. Attention is given to bee behavior, colony management, equipment, honey-plant identification, and honey production and processing. *Preq:* BIOL 1040 and BIOL 1060 and consent of instructor. *Coreq:* ENT 3081.

ENT 3081 Apiculture Laboratory 0 (3) Non-credit laboratory to accompany ENT 3080. *Coreq:* ENT 3080.

ENT (BIOL) 4000* Insect Morphology 4 (3) Study of insect structure in relation to function and of the variation of form in insects. Includes Honors sections. May also be offered as BIOL 4000. *Preq:* ENT 3010. *Coreq:* ENT 4001.

ENT (BIOL) 4001* Insect Morphology Laboratory 0 (3) Non-credit laboratory to accompany ENT 4000. May also be offered as BIOL 4001. *Coreq:* ENT 4000.

ENT 4040* Urban Entomology 3 (3) Study of pests common to the urban environment with emphasis on arthropod pest biology, pest importance, and management strategies. Students learn both theoretical and practical aspects of urban pest management. Includes Honors sections. *Preq:* BIOL 1030 and BIOL 1040; or BIOL 1100 and BIOL 1110; or ENT 3010.

ENT (PLPA) 4060* Diseases and Insects of Turfgrasses 2 (2) Host-parasite relationships, symptomatology, diagnosis, economics, and control of infectious diseases of turfgrasses and life histories, diagnosis, and control of important insect pests of turfgrasses. May also be offered as PLPA 4060. *Preq:* ENT 3010 and PLPA 3100.

ENT 4070* Applied Agricultural Entomology 3 (2) Topics include recognition, biology, damage, and control of economically important insects and mites found on major Southeastern field, fruit, nut, and vegetable crops. Principles and practices of crop protection, including pesticide application, economic basis for decision making, and development of scouting programs are introduced. *Preq:* ENT 3010. *Coreq:* ENT 4071.

ENT 4071* Applied Agricultural Entomology Laboratory 0 (3) Non-credit laboratory to accompany ENT 4070. *Coreq:* ENT 4070.

ENT (PLPA) 4080* Diseases and Insects of Turfgrasses Laboratory 1 (3) Laboratory to complement PLPA 4060 or ENT 4060 to learn symptomatology, diagnosis, and control of infectious diseases of turfgrasses and diagnosis of damage caused by important insect pests of turfgrasses. May also be offered as PLPA 4080. *Preq:* PLPA 4060 or ENT 4060.

ENT 4090* Urban Entomology Laboratory 1 (3) Identification of household and structural pests common to the urban environment. Students also gain hands-on experience in termite and general pest control. Includes Honors sections. *Preq:* BIOL 1030 and BIOL 1040; or BIOL 1100 and BIOL 1110; or ENT 3010. *Preq or concurrent enrollment:* ENT 4040.

ENT (BIOL) 4150* Insect Taxonomy 3 (1) Identification of the principal families of the major orders of adult insects. Laboratory work consists of intensive practice of such identification. Lecture material deals with theoretical discussion of taxonomic features observed in the laboratory. May also be offered as BIOL 4150. *Preq:* BIOL 4000 or ENT 4000. *Coreq:* ENT 4151.

ENT (BIOL) 4151* Insect Taxonomy Laboratory 0 (6) Non-credit laboratory to accompany ENT 4150. May also be offered as BIOL 4151. *Coreq:* ENT 4150.

ENT 4200* Systematics and Biodiversity 4 (3) Introduces systematic biology and the methods by which biologists recognize species, reconstruct the history of life, and use phylogenetic trees to study ecological and evolutionary processes. *Preq:* BIOL 1100 and BIOL 1110. *Coreq:* ENT 4201.

ENT 4201* Systematics and Biodiversity Laboratory 0 (3) Non-credit laboratory to accompany ENT 4200. *Coreq:* ENT 4200.

ENT (BIOL) 4360* Insect Behavior 3 (2) Fundamentals of insect behavior in an evolutionary and ecological perspective. Laboratory emphasizes generation and testing of hypotheses and observation, description, and quantification of insect behavior. May also be offered as BIOL 4360. *Preq:* ENT 3010. *Coreq:* ENT 4361.

ENT (BIOL) 4361* Insect Behavior Laboratory 0 (3) Non-credit laboratory to accompany ENT 4360. May also be offered as BIOL 4361. *Coreq:* ENT 4360.

ENT 4610 Directed Research in Entomology 1-3 (1-3) Development of a senior thesis based on a research problem in a selected entomological area. Emphasis is on integrating the knowledge gained in the student's program with the results of the research project. May be repeated for a maximum of three credits. *Preq:* Senior standing and consent of instructor.

ENT (BIOL, WFB) 4690* Aquatic Insects 3 (1) Identification, life history, habitats, and interrelationships of aquatic insects; techniques of qualitative field collecting; important literature and research workers. Includes Honors sections. May also be offered as BIOL 4690 or WFB 4890. *Preq:* ENT 3010. *Coreq:* ENT 4691.

ENT (BIOL, WFB) 4691* Aquatic Insects Laboratory 0 (6) Non-credit laboratory to accompany ENT 4690. May also be offered as BIOL 4691 or WFB 4691. *Coreq:* ENT 4690.

ENT 4900 Practicum 1-4 (1-4) Supervised entomological learning opportunity providing highly individualized experiences to complement other programs and courses. Must be prearranged at least two months in advance. Students must file written reports midway during enrollment period and at its conclusion and must appear for oral evaluation at the end of the period. *Preq:* Junior standing and consent of instructor.

ENT (GEN) 4950* Insect Biotechnology 3 (3) Considers many unique genetic features exhibited by insects and describes the applications of biotechnology to enhance useful products from insects and to affect the control of destructive insects. May also be offered as GEN 4950. *Preq:* ENT 3010 and GEN 3020.

ENT (PES) 4960 Selected Topics in Creative Inquiry 1-2 (1-2) Disciplinary and multidisciplinary projects with the goal of developing the student's ability to discover, analyze, evaluate, and present data. Students are required to document their activities in their ePortfolios. May be repeated for a maximum of six credits. May also be offered as PES 4960. *Preq:* Consent of instructor.

ENT (PES) 4970 Selected Topics in Creative Inquiry Laboratory 1-2 (1-2) Disciplinary and multidisciplinary research project with the goal of developing the student's ability to conduct research along with analysis, evaluation and presentation of results. Students are required to document their research activities in their ePortfolios. May be repeated for a maximum of six credits. *Preq:* Consent of instructor. May also be offered as PES 4970.

ENT 4980* Special Topics in Entomology 1-4 (1-4) Lecture and discussion coverage of selected topics in entomology, biodiversity and agricultural biology. May be repeated for a maximum of nine credits, but only if different topics are covered.

ENVIRONMENTAL TOXICOLOGY

Professors: W.V. Baird, V.S. Gallicchio, A.R. Johnson, S.J. Klaine, C.M. Lee, D.V. Maurice, J.C. Morse, C.D. Rice; *Associate Professors:* E.R. Carraway, J.W. Castle, M.A. Schlautman; *Assistant Professors:* D.G. Bielenberg, J. Brumaghim, P. van den Hurk, Y. Yang

ETOX 4000* Wildlife Toxicology 3 (3) Assessment of impacts of toxic substances on reproduction, health, and well-being of wildlife species; acute and chronic effects of agricultural chemicals, pesticides, hazardous waste, industrial waste, and oil releases are discussed. *Preq:* [BCHM 3010 or BCHM 3050; or both CH 2230 and CH 2270] and [BIOL 1040 and BIOL 1060; or BIOL 1110] and WFB 3500.

ETOX 4210* Chemical Sources and Fate in Environmental Systems 3 (3) Discusses chemical cycles in the environment on global and microcosm scales. Examines the dependence of fate processes on physical and chemical properties and environmental conditions. Addresses breakdown, movement, and transport of selected toxicants to illustrate the mechanisms that govern chemical fate. Includes Honors sections. *Preq:* CH 2230 and CH 2270 and CH 3130.

ETOX 4300* Toxicology 3 (3) Basic principles of toxicology, including quantitation of toxicity, toxicokinetics, biochemical action of poisons, and environmental toxicology, are studied. Acute and chronic effects of various classes of poisons (e.g., pesticides, drugs, metals, and industrial pollutants) are discussed in relation to typical routes of exposure and regulatory testing methods. *Preq:* CH 2230 and CH 2270; and either BIOL 1040 and BIOL 1060; or BIOL 1110.

ETOX 4370* Ecotoxicology 3 (3) Study of the effects of stressors on the ecosystem. Explores the integrative relationships that comprise the field of ecotoxicology in a hierarchical format that focuses on the various levels of ecological organization. *Preq:* ETOX 4300.

ETOX 4460 Soil and Water Quality: Fundamentals 3 (3) Studies those aspects of water quality that are influenced by soil systems. Many water quality concerns arise from land-applied chemicals, natural or manufactured. Basic soil and water chemistry principles including sorption, solution chemistry, and soil chemical transport are studied. *Preq:* CH 2240.

ETOX 4470 Soil and Water Quality: Applications 3 (3) Potential for water quality concerns arising from land application of natural or manufactured chemicals is varied. Case studies of potential water quality concerns related to fertilizers, pesticides, biosolids, manures, and other sources are presented. Practices that can improve water quality are also studied and evaluated. *Preq:* CH 2240.

ETOX (GEOL, PES) 4850* Environmental Soil Chemistry 3 (3) Study of soil chemical processes (sorption, desorption, ion exchange, precipitation, dissolution, and redox reactions) of nutrients and inorganic and organic contaminants in soils and organic matter. Chemical complex equilibria and adsorption phenomena at the solid (soil, sediment, and mineral) water interface are emphasized. May also be offered as GEOL 4850 or PES 4850. *Preq:* CH 1020 or PES 2020.

FOOD SCIENCE

Professors: F.H. Barron, K.L. Cason, F. Chen, P.L. Dawson, A.K. Greene, X. Jiang, J.U. McGregor, J.K. Northcutt, A.L. Pometto III, R.L. Thomas; *Associate Professors:* M.D. Condrasky, A.M. Fraser, V.J. Haley-Zitlin; *Senior Lecturers:* A.D. Coffee, H.P. Batt, R.M. Haliema; *Adjunct Professor:* R.J. Vander Zanden; *Adjunct Associate Professors:* K.M. Keener, D.P. Smith; *Adjunct Assistant Professors:* P.S. Manhani, G.G. Pearl, E.J. Rhodehamel, P. Wan, K.A. Young; *Adjunct Instructors:* R.R. Perdue, L.J. Pfahl, K.G. Schwartz

FDSC 1010 Introduction to Food Science and Human Nutrition 1 (1) Introductory course providing an overview of career opportunities in both food science and human nutrition disciplines. Provides an orientation to principles related to food and human nutrition.

FDSC 1020 Perspectives in Food and Nutrition Sciences 1 (1) Discussion course covering topics related to food science and human nutrition. Subjects include topics of current interest and involve familiarization with scientific literature in nutrition and food sciences. *Preq:* Food Science major or minor.

FDSC 2010 Man and His Food 2 (2) Study of food and food products emphasizing nutrients, nutrient needs, and the relationship between nutrient intake and health. Also discusses food additives, nutritional awareness (including nutrition labeling), food protection, and the influence of processing on nutritional quality of food.

FDSC 2140 Food Resources and Society 3 (3) Introduces the basics of food science (food chemistry, food microbiology, and food processing principles) and relates how advances in food science have paralleled societal advances and created social controversy.

FDSC 2150 Culinary Fundamentals 2 (1) Emphasizes the safe handling of food utilizing recognized procedures in equipment safety and sanitation. Cooking methods are investigated, along with ingredient functionality and flavor development. Organizational skills utilized in a real-world environment assist students in preparing, presenting and evaluating their finished products. *Preq:* Food Science major. *Coreq:* FDSC 2151.

FDSC 2151 Culinary Fundamentals Laboratory 0 (3) Non-credit laboratory to accompany FDSC 2150. *Preq:* Food Science major. *Coreq:* FDSC 2150.

FDSC 2160 Fundamentals of Baking Science 2 (1) Emphasizes the science of baking, ingredient functionality, formulas and Bakers Percentages, and various mixing methods used to produce an array of baked products. Organizational skills, utilized in a real world environment, assist students in preparing, presenting and evaluating their finished products. *Preq:* Food Science major. *Coreq:* FDSC 2161.

FDSC 2161 Fundamentals of Baking Science Laboratory 0 (3) Non-credit laboratory to accompany FDSC 2160. *Preq:* Food Science major. *Coreq:* FDSC 2160.

FDSC 2500 Culinary Science Internship 0 (0) Students experience the science and art of food preparation, with the ultimate object of improving the ease of manufacture as well as the overall quality and nutrition of the food produced. Students are able to observe, interact, and practice principles of culinary sciences. To be taken Pass/No Pass only. *Preq:* FDSC 2150.

FDSC 3010 Food Regulation and Policy 1 (1) Identifies the role of the FDA and FSIS in food regulations, regulatory compliance and enforcement. Other agencies involved in peripheral decisions are also discussed (U.S. Customs, EPA, USDA-AMS, USDA-APHIS, etc.) Introduces food safety concepts, such as HACCP, GMPs, SSOPs, and food defense/security. *Preq:* Food Science major or minor or Packaging Science major or minor; and FDSC 2140 and BCHM 3050.

FDSC 3040 Evaluation of Dairy Products 2 (1) Emphasizes sensory evaluation of dairy products. Discusses basic principles of organoleptic evaluation, fundamental rules for scoring and grading dairy products; evaluation of all classes of dairy products based on established grades and score cards. *Preq:* Food Science major or minor. *Coreq:* FDSC 3041.

FDSC 3041 Evaluation of Dairy Products Laboratory 0 (2) Non-credit laboratory to accompany FDSC 3040. *Coreq:* FDSC 3040.

FDSC 3060 Institutional Foodservice Management 3 (3) Principles of management of resources in institutional food service systems. Emphasizes financial management, menu planning, principles of quantity food production, and safety and sanitation. *Preq:* Food Science major.

FDSC 3070 Restaurant Food Service Management 3 (3) Essentials of successful operation of restaurants, including menu design and pricing, marketing, customer satisfaction, purchasing, kitchen operations, and employment relationships.

FDSC 3500 Food Science Internship 0 (0) Summer internship offered by the Food, Nutrition and Packaging Sciences Department and the Clemson Micro-Creamery and Food Manufacturing Industries. Students observe, interact, and practice principles of food science within the food industry. To be taken Pass/No Pass only. *Preq:* FDSC 2140.

FDSC 4010* Food Chemistry I 3 (3) Basic composition, structure, and properties of food and the chemistry of changes occurring during processing utilization. Includes Honors sections. *Preq:* BCHM 3050; and Food Science major or minor or Packaging Science major or minor.

FDSC 4020* Food Chemistry II 3 (3) Application of theory and procedures for quantitative and qualitative analysis of food ingredients and food products. Methods for protein, moisture, lipid, carbohydrate, ash, fiber, rancidity, color, and vitamin analyses and tests for functional properties of ingredients are examined. Includes Honors sections. *Preq:* BCHM 3050; and Food Science major or minor.

- FDSC 4030* Food Chemistry and Analysis 2 (1)** Principles of analytical procedures and techniques used to quantitatively and qualitatively determine chemical composition of foods, and elucidate the physio-chemical properties of food materials. Laboratories provide experience in critical thinking, performing food analysis, and analyzing data. *Preq:* BCHM 3050 and BIOL 4340 and FDSC 2140; and Food Science major or minor. *Coreq:* FDSC 4031.
- FDSC 4031* Food Chemistry and Analysis Laboratory 0 (3)** Non-credit laboratory to accompany FDSC 4030. *Coreq:* FDSC 4030.
- FDSC 4040* Food Preservation and Processing 3 (3)** Principles of food preservation applied to flow processes, ingredient functions, and importance of composition and physical characteristics of foods related to their processing; product recalls and product development concepts. *Preq:* Food Science major or minor or Packaging Science major or minor; and BCHM 3050; and either FDSC 2140 or FDSC 3010; and one of PHYS 1220 or PHYS 2000 or PHYS 2070.
- FDSC 4060* Food Preservation and Processing Laboratory I 1 (3)** Laboratory exercises on preservation methods, equipment utilized, and processes followed in food manufacture. *Preq:* FDSC 4040.
- FDSC 4070* Quantity Food Production 2 (1)** Principles of the production of food in quantity for use in food service systems. Emphasizes functions of components of foods and of ingredients in food, and focuses on the quality of the final product, on safe production of food, and on proper use of equipment. *Preq:* Food Science major or minor, or Packaging Science major or minor. *Coreq:* FDSC 4071.
- FDSC 4071* Quantity Food Production Laboratory 0 (3)** Non-credit laboratory to accompany FDSC 4070. *Coreq:* FDSC 4070.
- FDSC 4080* Food Process Engineering 4 (3)** Study of basic engineering principles and their application in food processing operations. Emphasizes the relation between engineering principles and fundamentals of food processing. *Preq:* Food Science major or minor; and CH 1020 and FDSC 2140; and one of MATH 1020 or MATH 1060; and one of PHYS 1220 or PHYS 2000 or PHYS 2070. *Coreq:* FDSC 4081.
- FDSC 4081* Food Process Engineering Laboratory 0 (3)** Non-credit laboratory to accompany FDSC 4080. *Coreq:* FDSC 4080.
- FDSC (PKSC) 4090* Total Quality Management for the Food and Packaging Industries 3 (3)** Introduction to the principles of modern quality management emphasizing quality standards and issues and the practices necessary for food processing and packaging companies to survive in a customer-driven marketplace. May also be offered as PKSC 4090.
- FDSC 4100* Food Product Development 4 (3)** A strategic and systems approach to integrated product development practices for developing new food products within a team setting. Focuses on the Stage-Gate process for moving from product idea to launch and application of sensory analysis techniques. *Preq:* Food Science major or minor; and Junior standing. *Preq or concurrent enrollment:* FDSC 4030. *Coreq:* FDSC 4101.
- FDSC 4101* Food Product Development Laboratory 0 (3)** Non-credit laboratory to accompany FDSC 4100. *Coreq:* FDSC 4100.
- FDSC 4170 Seminar 1 (1)** Literature research and oral presentation of a current food science topic. *Preq:* Food Science major.
- FDSC 4180 Seminar 1 (1)** Literature research and oral presentation of a current food science topic.
- FDSC 4200 Special Topics in Food Science 1-3 (1-3)** Special topics in food science not covered in other courses. May be repeated for a maximum of 12 credits, but only if different topics are covered. Includes Honors sections. *Preq:* Consent of instructor.
- FDSC 4210 Special Problems in Food Science 1-4 (1-4)** Independent research investigation in food science areas not conducted in other courses. May be repeated for a maximum of 12 credits. Includes Honors sections. *Preq:* Consent of instructor.
- FDSC 4300* Dairy Processing and Sanitation 3 (2)** Processing, manufacture and distribution of fluid, frozen, cultured and other dairy products. Emphasizes sanitation in a commercial food processing plant environment, chemical and microbiological aspects, processing procedures, equipment operation, ingredient applications, formulation and functional properties. *Preq:* BIOL 1040 and BIOL 1060 and CH 1020. *Coreq:* FDSC 4301.
- FDSC 4301* Dairy Processing and Sanitation Laboratory 0 (3)** Non-credit laboratory to accompany FDSC 4300. *Coreq:* FDSC 4300.
- FDSC 4500 Creative Inquiry—Food Science 1-6 (1-6)** Individual or small team research experience in close collaboration with a faculty member. Expands undergraduate learning by application of the scientific method. Research is selected by the student with approval of faculty. May be repeated for a maximum of ten credits.
- FDSC 4910 Practicum 1-4 (1-4)** Supervised experiential opportunities in the food industry. May be repeated for a maximum of 12 credits. *Preq:* Food Science major and Junior standing and consent of department chair.

FINANCE

Professors: J.C. Alexander Jr., M.F. Spivey, T.M. Springer, N.G. Waller; *Associate Professors:* J.M. Harris Jr., A.G. Morgan, J.R. Pierce, J.G. Wolf, F. Xie; *Assistant Professors:* D.T. Greene, G.B. Lockhart, T. Tang; *Lecturer:* K.D. McMillan

- FIN 2010 Introduction to Personal Finance 1 (1)** Provides an introductory overview of personal finance with an emphasis on budgeting; consumer credit, including student loans, credit cards, and basic bank loans; personal bank services; and purchasing an automobile and property insurance.
- FIN 3010 Personal Finance 3 (3)** Analysis of the preparations of personal financial plans. Topics include savings and budgeting, personal taxes, housing and automobile decisions, loans, insurance needs, investments, and retirement needs. May not be counted toward a major or minor in Financial Management.

- FIN 3040 Risk and Insurance 3 (3)** Studies the nature of risk and the role of insurance in risk management from individual and business viewpoints. Topics include probability, theory of the firm under uncertainty, insurance carriers and contracts, underwriting, and regulation. *Preq:* FIN 3060 or FIN 3110.
- FIN 3050 Investment Analysis 3 (3)** Study of techniques useful in analyzing alternative investment opportunities with emphasis on corporate securities. Investment planning and portfolio management are considered. *Preq:* FIN 3060 or FIN 3110, each with a C or better.
- FIN 3060 Corporation Finance 3 (3)** Introduction to financial management of nonfinancial firms. Includes such topics as analysis of financial statements, financial forecasting, capital budgeting, working capital management, and long-term financing decisions. Credit may not be received for both FIN 3060 and FIN 3110. *Preq:* ACCT 2010; and one of the following courses: IE 3610 or MATH 3020 or PSYC 3090 or STAT 2300 or STAT 3090.
- FIN 3070 Principles of Real Estate 3 (3)** Acquaints students with the theories, practices, and principles that govern real estate markets. Major emphasis is on specifics of real estate brokerage, property rights, and ownership; making real estate investment decisions; and financing real estate investments. *Preq:* FIN 3060 or FIN 3110, each with a C or better.
- FIN 3080 Financial Institutions and Markets 3 (3)** Study of the various types of financial institutions and of topics critical to the financial institutions practitioner. Topics include financial regulations, financial security types and their yields, interest rate risk management, foreign currency risks management, and stock index futures. *Preq:* FIN 3060 or FIN 3110, each with a C or better.
- FIN 3110 Financial Management I 3 (3)** First in a two-course sequence to provide in-depth exposure to the theory and practice of corporate financial management and to demonstrate how financial management techniques are applied in decision making. Credit may not be received for both FIN 3060 and FIN 3110. Includes Honors sections. *Preq:* ACCT 2010 with a C or better; and one of the following: IE 3610 or MATH 3020 or PSYC 3090 or STAT 3090 or STAT 3300.
- FIN 3120 Financial Management II 3 (3)** Continuation of the two-course sequence that begins with FIN 3110. Includes Honors sections. *Preq:* FIN 3060 or FIN 3110, each with a C or better.
- FIN 3980 Creative Inquiry—Finance 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. *Preq:* Consent of faculty member/mentor.
- FIN 3990 Finance Internship 1-3 (1-3)** Pre-planned, pre-approved, faculty-supervised internships to give students on-the-job learning in support of classroom education. Internships must be no fewer than six full-time, consecutive weeks with the same internship provider. Restricted to students with a major or minor in Financial Management. To be taken Pass/No Pass only. *Preq:* Consent of instructor.

FIN 4010 Corporate Financial Analysis 3 (3) In this course, students explore the potential needs of financial statement end users (managers, investors, creditors) so different perspectives can be considered when decisions are made. Students also learn to interpret and convert raw numerical data into information about profitability and risk in order to assess the value of a firm. *Preq:* ACCT 3110 and FIN 3120, each with a C or better; and Financial Management major.

FIN 4020* Corporate Valuation 3 (3) Study of the decision process and analytical techniques used in evaluating corporate investment and financing decisions. Topics include capital budgeting, capital structure and bankruptcy, valuation, corporate governance, executive compensation, mergers and acquisitions, and restructuring. Includes Honors sections. *Preq:* FIN 3120 with a C or better.

FIN 4030 Spreadsheet Applications in Finance 3 (3) Using a combination of lectures and assignments emphasizing small-scale applications, this course focuses on the development of spreadsheet skills in corporate finance. Beginning with the theoretical base established in previous courses, students work through problems related to the time value of money, capital budgeting, and valuation using spreadsheet analysis. Credit toward a degree will be given for only one of FIN 4030 or 4040. *Preq:* FIN 3120 with a C or better; and CPSC 2200 or MGT 2180.

FIN 4040 Financial Modeling 3 (3) Helps students develop the practical skills that combine theory, business planning, and forecasting needed to make financial decisions. Emphasizes the use of spreadsheet software used to set up and solve these models. Topics include financial statement analysis, valuation, and cost of capital. Includes Honors sections. Credit toward a degree will be given for only one of FIN 4030 and 4040. *Preq:* FIN 3120 with a C or better; and either CPSC 2200 or MGT 2180; and consent of instructor.

FIN 4050 Portfolio Management and Theory 3 (3) Introduction to portfolio management. Includes the underlying theory, managing the equity and the fixed-income portfolios, portfolio evaluation, options-pricing theory, futures markets and instruments. Includes Honors sections. *Preq:* FIN 3050 with a C or better.

FIN 4060* Analysis and Use of Derivatives 3 (3) Consideration of the option pricing theory and strategy techniques most commonly used in the market for options. Also considers an overview of the futures markets. Special emphasis is given to interest-rate futures, stock-index futures, and foreign-exchange futures. Includes Honors sections. *Preq:* FIN 3050 with a C or better.

FIN 4080 Management of Financial Institutions 3 (3) Detailed study of the operational, marketing, and regulatory aspects of the management of depository financial institutions. Emphasizes decision making through the extensive use of cases. *Preq:* FIN 3080 with a C or better.

FIN 4090 Professional Financial Planning 3 (3) Concepts and practical implementation of professional financial planning focusing on essentials of budgeting and saving, risk management, tax planning, investment planning, and retirement and estate planning. Emphasizes integrating these elements into a comprehensive personal financial plan. *Preq:* ACCT 4040 and ACCT 4080 and FIN 3040 and FIN 3050.

FIN 4100 Research in Finance 1-3 (1-3) Directed research for students interested in careers in finance. Research topic is selected by student and approved by instructor. A formal research paper is required. Includes Honors sections. *Preq:* FIN 3060 or FIN 3120; and consent of instructor.

FIN 4110 International Financial Management 3 (3) Extension of the principles of finance to the international context. Focuses on implications of the existence of multiple currencies and the operations across borders of sovereign nation-states for the multinational corporation. *Preq:* FIN 3060 or 3120 with a C or better.

FIN 4150* Real Estate Investment 3 (3) Focuses on the structure and analysis of real estate investment emphasizing financial theory and analysis technique. Case study and project-oriented homework assignments facilitate the understanding of real estate investments. *Preq:* FIN 3070 with a C or better.

FIN 4160* Real Estate Valuation 3 (3) Advanced course in commercial real estate valuation. Topics include income capitalization, cash equivalency, highest and best use analysis, the cost approach, the direct sales comparison approach, and DCF analysis. *Preq:* FIN 3070 with a C or better.

FIN 4170* Real Estate Finance 3 (3) Advanced course applying financial analysis and theory to real estate. Emphasizes mortgage credit analysis and current financing techniques for residential and commercial properties. Topics include financial institutions, syndications, and construction financing. *Preq:* FIN 3070 with a C or better.

FIN 4980 Creative Inquiry—Finance 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. *Preq:* Consent of faculty member/mentor.

FIN 4990 Special Topics in Finance 3 (3) In-depth examination of specialized topics in finance. Topics vary depending on developments in the profession and interests of faculty. May be repeated for a maximum of six credits if different topics are covered. *Preq:* FIN 3120 with a C or better.

FORESTRY AND NATURAL RESOURCES

Professors: J.D. Lanham, P.A. Layton, G.K. Yarrow, *Chair; Associate Professors:* R.F. Baldwin, E. Mikhailova, C.J. Post; *Assistant Professors:* D. Jachowski, Y. Kanno, *Extension Associate:* R.D. Willey

FNR 1020 Forestry and Natural Resources Freshman Portfolio 1 (1) Informative sketch of forestry, wildlife biology, and natural resources; education and career opportunities for natural resource professionals. Students initiate their Web-based student portfolios, which showcase their skills and experiences (e.g., resumes, accomplishments, and work samples) during their undergraduate degree. To be taken Pass/No Pass only. Restricted to students enrolled in one of the following majors: Environmental and Natural Resources; or Forest Resource Management; or Wildlife and Fisheries Biology.

FNR 2040 Soil Information Systems 4 (3) Includes input, storage, analysis, and output of soil information through the use of global positioning systems, direct/remote sensing, geographic information systems, and web soil survey. Provides fundamental knowledge of the role of soils in forest and wildlife management. *Preq:* One of the following combinations: CH 1010 and CH 1020; or CH 1050 and CH 1060. *Coreq:* FNR 2041.

FNR 2041 Soil Information Systems Laboratory 0 (3) Non-credit laboratory to accompany FNR 2040. *Coreq:* FNR 2040.

FNR 4660* Stream Ecology 3 (2) Covers the ecology of flowing water systems. Topics include geomorphology, physical and chemical factors of streams, biology of stream-dwelling organisms, trophic relationships, competition, colonization, drift, community structure, disturbance, and human impacts. *Preq:* Junior standing. *Coreq:* FNR 4661.

FNR 4661* Stream Ecology Laboratory 0 (3) Non-credit laboratory to accompany FNR 4660. *Coreq:* FNR 4660.

FNR 4700 Creative Inquiry 1-3 (1-3) Multi-semester commitment to participate in forestry and natural resources research with a group of peers, mentored by a faculty member or advanced graduate student. Students learn to collect, analyze, evaluate, and present information. May be repeated for a maximum of six credits. *Preq:* Consent of instructor.

FNR 4900 Field Training in Natural Resources 3 (9) Four to eight week internship in which students work in natural resources. Students have supervised management responsibility. Total of 135 hours required. Must be arranged at least two months in advance. *Preq:* Senior standing in one of the following majors: Environmental and Natural Resources; or Forestry; or Wildlife and Fisheries Biology.

FNR 4910 Senior Honors Thesis I 3 (3) Individual research for students in the Forestry and Natural Resources Honors Program. Focuses on developing a plan of research under the direction of a faculty advisory committee. *Preq:* Senior standing, membership in Calhoun Honors College, and consent of instructor.

FNR 4920 Senior Honors Thesis II 3 (3) Individual natural resources research for students in the Forestry and Natural Resources Honors Program. Focuses on data collection, analysis, report writing, and oral presentation. *Prq:* FNR 4910.

FNR 4990 Natural Resources Seminar 1 (1) Exploration of current literature and research in natural resources. Students participate in the analysis of research findings, utilizing skills acquired in their undergraduate programs. May be repeated for maximum of two credits.

FORESTRY

Professors: W.H. Conner, J.D. Lanham, P.A. Layton, J.H. Rodgers Jr., T.J. Straka, G.G. Wang, G.K. Yarrow, *Chair; Associate Professors:* R.F. Baldwin, L.R. Gering, A.R. Johnson, E. Mikhailova, C.J. Post, R.B. Powell, C.E. Wells; *Lecturer:* D. Hagen; *Extension Associate:* R. Polomski

FOR 1010 Introduction to Forestry 1 (1) Informative sketch of forestry, forests, and forestry tasks of the nation. Includes education and career opportunities for foresters.

FOR 2050 Dendrology 2 (1) Classification, nomenclature, and identification of the principal forest trees of the United States, their geographical distribution, ecological requirements, and economic importance. Includes field identification of native trees and commonly planted exotics of the Southeast. *Prq:* BIOL 1030 and BIOL 1050. *Coreq:* FOR 2051 and FOR 2210.

FOR 2051 Dendrology Laboratory 0 (3) Non-credit laboratory to accompany FOR 2050. *Coreq:* FOR 2050.

FOR 2060 Forestry Ecology 3 (2) Study of the nature of forests and forest trees, how they grow, reproduce, and their relationships to the physical and biological environment. Offered spring semester only. *Prq:* BIOL 1030 and BIOL 1050; or FOR 2050; or PES 2020. *Coreq:* FOR 2061.

FOR 2061 Forestry Ecology Laboratory 0 (3) Non-credit laboratory to accompany FOR 2060. *Coreq:* FOR 2060.

FOR 2210 Forest Biology 3 (3) Study of woody plant form and function, wood properties, general physiology and forest biomes of North America. Presented as a companion course to dendrology lab. *Prq:* BIOL 1030 and BIOL 1050. *Coreq:* FOR 2050.

FOR 2270 Arboricultural Field Techniques 1 (3) Skills and techniques required to safely climb trees for tree maintenance. Emphasizes safety, proper equipment, and basic tree maintenance treatments. To be taken Pass/No Pass only.

FOR 2510 Forest Communities 2 (6) Study of forest plant species and their successful status and habitat requirements with respect to landform, soil type, and other appropriate aspects of site classification. *Prq:* FOR 2050.

FOR 2520 Forest Operations 1 (3) Introduction and tour of forest operations activities throughout South Carolina. Includes timber harvesting, site preparation, and applied silvicultural processes. *Prq:* Junior standing.

FOR 2530 Forest Mensuration 4 (12) Introduction to measurements of land, individual trees, forest stands, forest products, and the application of mensurational techniques to the statistical and physical design of forest sampling methods, including measurement techniques of non-timber components of forest resources. *Prq:* FOR 2050.

FOR 2540 Forest Products (Summer Camp) 1 (3) Tour of the forest products industry of South Carolina emphasizing those products and processes of some distinction or special interest. *Prq:* FOR 2050.

FOR 3020 Forest Biometrics 2 (1) Application of statistical methods to forestry problems, including sampling theory and methods, growth measurements and prediction, and application of micro-computing to analysis of forestry data. *Prq:* FOR 2530. *Prq or concurrent enrollment:* STAT 2300. *Coreq:* FOR 3021.

FOR 3021 Forest Biometrics Laboratory 0 (3) Non-credit laboratory to accompany FOR 3020. *Coreq:* FOR 3020.

FOR 3040 Forest Resource Economics 3 (3) Economic problems and principles involved in the utilization of forest resources and distribution of forest products. Includes analysis of integrated forest operations. *Prq:* AGRB 2570 or ECON 2000 or ECON 2110 or ECON 2120.

FOR 3080 Remote Sensing in Forestry 2 (1) Introduction to remote sensing, aerial photo interpretation, computer mapping, aerial photo timber estimating, and geographical information systems. *Prq:* FOR 2510 and FOR 2520 and FOR 2530 and FOR 2540. *Coreq:* FOR 3081.

FOR 3081 Remote Sensing in Forestry Laboratory 0 (3) Non-credit laboratory to accompany FOR 3080. *Coreq:* FOR 3080.

FOR 3140 Harvesting and Forest Products 4 (3) Harvesting of forest products, structure and properties of economically important timbers, and production and properties of primary forest products. *Prq:* FOR 2510 and FOR 2520 and FOR 2530 and FOR 2540. *Coreq:* FOR 3141.

FOR 3141 Harvesting and Forest Products Laboratory 0 (3) Non-credit laboratory to accompany FOR 3140. *Coreq:* FOR 3140.

FOR 3410 Wood Procurement Practices in the Forest Industry 3 (3) Study of wood raw material procurement practices currently employed by the forest products industry, including pulp, paper, and related areas. *Prq:* FOR 2510 and FOR 2520 and FOR 2530 and FOR 2540.

FOR 4060 Forested Watershed Management 2 (1) Lectures and discussions on measurements and processes affecting water quality and quantity within watersheds. Introduction to hydrologic principles, geomorphology, and water quality assessment. Discusses best management practices for silviculture and development of a watershed management plan. *Coreq:* FOR 4061.

FOR 4061 Forested Watershed Management Laboratory 0 (3) Non-credit laboratory to accompany FOR 4060. *Coreq:* FOR 4060.

FOR 4080* Wood and Paper Products 3 (3) Study of wood structures and identification; physical and mechanical properties of wood products; standard testing procedures; manufacture of lumber, plywood, oriented strand board; drying, preservation, grading, and use of wood products. Also discusses common grades of paper and paperboard; fiber sources; pulping and paper-making equipment and processes; chemical recovery process; and environmental issues. *Prq:* Junior standing.

FOR 4100* Harvesting Processes 4 (3) Study of forest harvesting processes with detailed analysis of production, cost, environmental impacts, safety, transportation, and business considerations. *Prq:* Senior standing. *Coreq:* FOR 4101.

FOR 4101 Harvesting Processes Laboratory 0 (3) Non-credit laboratory to accompany FOR 4100. *Coreq:* FOR 4100.

FOR 4130* Integrated Forest Pest Management 4 (3) Nature and control of pests of forest trees and products. Focuses on the relation of pests to silviculture, management, and natural forest ecosystems. *Prq:* Junior standing in Forest Resource Management field of study. *Coreq:* FOR 4131.

FOR 4131* Integrated Forest Pest Management Laboratory 0 (3) Non-credit laboratory to accompany FOR 4130. *Coreq:* FOR 4130.

FOR 4150* Forest Wildlife Management 3 (2) Principles, practices, and problems of wildlife management emphasizing upland forest game species. Habitat manipulation through use of appropriate silvicultural practices in association with other techniques is evaluated. *Prq:* FOR 4600. *Coreq:* FOR 4151.

FOR 4151* Forest Wildlife Management Laboratory 0 (3) Non-credit laboratory to accompany FOR 4150. *Coreq:* FOR 4150.

FOR (ENR) 4160* Forest Policy and Administration 3 (3) Introduction to the development, principles, and legal provisions of forest policy in the United States and an examination of administrative and executive management in forestry. May also be offered as ENR 4160.

FOR 4170* Forest Resource Management and Regulation 3 (3) Fundamental principles and analytical techniques in planning, management, and optimization of forest operations. *Prq:* FOR 3020 and FOR 3080 and FOR 4180 and FOR 4650.

FOR 4180* Forest Resource Valuation 3 (3) Analysis of capital investment tools and their application to decision making among forestry investment alternatives; valuation of land, timber, and other resources associated with forestry, including the impact of inflation and taxes. *Prq:* FOR 3040.

FOR 4190 Senior Problems 1-3 (1-3) Problems chosen with faculty approval in selected areas of forestry. With department chair's approval, may be repeated once for credit. *Prq:* Senior standing.

FOR 4230 Current Issues in Natural Resources 2 (2) Lectures in various fields of forestry delivered by selected representatives from forest industries, consultants, agencies, associations, and other forestry operations. Will not be taught when enrollment is less than 15. To be taken Pass/No Pass only. *Prq:* Junior standing.

FOR 4250 Forest Resource Management Plans 2 (1)
Development of multiple resource forest management plans. Economic and environmental impacts of implementing management plans. *Preq:* FOR 4170. *Coreq:* FOR 4251.

FOR 4251 Forest Resource Management Plans Laboratory 0 (3) Non-credit laboratory to accompany FOR 4250. *Coreq:* FOR 4250.

FOR 4260 Forest Resource Management Plans Seminar 1 (1) In-depth exploration of topics and problems presented in FOR 4250. To earn honors credit, students must be enrolled in corequisite FOR 4250 and earn a B or better in both courses. Includes Honors sections. *Preq:* Senior standing and consent of instructor. *Preq or concurrent enrollment:* FOR 4250.

FOR (HORT) 4270* Urban Tree Care 3 (3)
Principles, practices, and problems of protecting and maintaining trees in urban and recreational areas. Examines environmental and biological factors affecting trees in high-use areas, their management and cultural requirements, and the practices necessary for their protection and care as valuable assets in the landscape. May also be offered as HORT 4270. *Preq:* FOR 2050 or HORT 3030.

FOR 4310* Recreation Resource Planning in Forest Management 2 (1) Analysis of forest recreation as a component of multiple-use forest management; techniques of planning; physical and biological effects on forest environments; and forest site, user, and facility management. *Coreq:* FOR 4311.

FOR 4311* Recreation Resource Planning in Forest Management Laboratory 0 (3) Non-credit laboratory to accompany FOR 4310. *Coreq:* FOR 4310.

FOR 4330* GPS Applications 3 (2) Develops competence in global positioning system (GPS) technology, including theory, methods, and application to natural resources mapping. Topics include basic concepts of GPS; projection systems; types of data; mission planning; and data capture, correction, and export to geographical information systems (GIS). *Preq:* Senior standing. *Coreq:* FOR 4331.

FOR 4331* GPS Applications Laboratory 0 (3) Non-credit laboratory to accompany FOR 4330. *Coreq:* FOR 4330.

FOR (ENR) 4340* Geographic Information Systems for Natural Resources 3 (2) Develops competence in geographic information systems (GIS) technology and its application to various spatial analysis problems in natural resources. Topics include data development and management, spatial analysis techniques, critical review of GIS applications, needs analysis and institutional context. GIS hardware and software, hands-on application. Credit may be received for only one of ENR 4340 or FOR 4340. May also be offered as ENR 4340. *Coreq:* FOR 4341.

FOR (ENR) 4341 Geographic Information Systems for Natural Resources Laboratory 0 (3) Non-credit laboratory to accompany FOR 4340. May also be offered as ENR 4341. *Coreq:* FOR 4340.

FOR 4410* Properties of Wood Products 3 (3) Basic properties of wood, including the hygroscopic, thermal, electrical, mechanical, and chemical properties; standard testing procedures for wood. *Preq:* Junior standing.

FOR 4420* Manufacture of Wood Products 3 (3)
Study of the manufacture of lumber, plywood, poles, piles; drying, preservation, grading, and uses of wood products. Considers the manufacture of particleboard, flakeboard, oriented-strand board, fiberboard, and paper products. Includes physical, mechanical, and chemical properties and their applications. *Preq:* Consent of instructor.

FOR 4440* Forest Products Marketing and International Trade 3 (3) Study of marketing and international trade practices currently employed by the forest products industry and the application of basic marketing principles and global trade concepts in the industry's current and future environment. *Preq:* FOR 4420.

FOR 4470 Special Problems in Forest Products 1-3 (1-3) Laboratory, library, or field study of problems in selected areas of forest products. Emphasizes the planning and execution of research and the reporting of results. Research must be conducted under the guidance of a Forest Products faculty member. May be repeated for a maximum of three credits, but only if different topics are covered. *Preq:* Senior standing and consent of instructor.

FOR (BE, EES) 4510* Newman Seminar and Lecture Series in Natural Resources Engineering 1 (2) Topics dealing with development and protection of land, air, water, and related resources are covered by seminar with instructor and invited lecturers. Current environmental and/or resource conservation issues are addressed. Includes Honors sections. May also be offered as BE 4510 or EES 4510. *Preq:* Senior standing.

FOR 4610 Silviculture Honors Seminar I 1 (1) In-depth exploration of topics and problems presented in FOR 4650. To earn honors credit, students must be enrolled in FOR 4650 and earn a B or better in both courses. *Preq:* Junior standing and consent of instructor. *Preq or concurrent enrollment:* FOR 4650.

FOR 4630 Silviculture Honors Seminar II 1 (1) In-depth exploration of topics and problems presented in FOR 4650. To earn honors credit, students must be enrolled in FOR 4650 and earn a B or better in both courses. *Preq:* Junior standing and consent of instructor. *Preq or concurrent enrollment:* FOR 4650.

FOR 4650* Silviculture 4 (3) Discussion of the theory and practice of manipulating forests to meet the needs and values of landowners and society in accordance with biological, ecological, and economic principles. *Preq:* FOR 2060 and FOR 2510 and FOR 2520 and FOR 2530 and FOR 2540. *Coreq:* FOR 4651.

FOR 4651* Silviculture Laboratory 0 (3) Non-credit laboratory to accompany FOR 4650. *Coreq:* FOR 4650.

FOR 4800 Selected Topics in Urban Forestry 1-3 (1-3) Study of selected and varied topics, problems, and issues in urban forestry and arboriculture through readings, class discussion, and individual and group projects. *Preq:* FOR 4270 or HORT 4270.

FOR 4930 Selected Topics in Forest Resources 1-15 (1-15) Specialized topics not covered in other courses that explore current areas of research and management in forest resources in a format of lecture, lab, or both. May be repeated for a maximum of 15 credits, but only if different topics are covered. *Preq:* Junior standing.

FOR 4980 Senior Portfolio 1 (1) Collection of Web-based materials representing the creative and scientific papers, presentations, and résumés written by students to satisfy curriculum requirements. Students are informed in FNR 1020 and regularly thereafter regarding the format and content of their portfolios. *Preq or concurrent enrollment:* FOR 4250.

FRENCH

Associate Professors: J. Mai, E.R. Touya; *Assistant Professor:* K. Peebles; *Lecturers:* A. Sawyer, K. Widgren

FR 1010 Elementary French 4 (3) Multimedia course for beginners that combines video, audio, and print to teach the fundamentals of the French language and culture. Emphasizes communicative proficiency (listening comprehension, speaking, reading, and writing). *Coreq:* FR 1011.

FR 1011 Elementary French Laboratory 0 (1) Non-credit laboratory to accompany FR 1010. *Coreq:* FR 1010.

FR 1020 Elementary French 4 (3) Continuation of FR 1010; three hours a week of classroom instruction and one hour a week in the language laboratory. *Coreq:* FR 1021.

FR 1021 Elementary French Laboratory 0 (1) Non-credit laboratory to accompany FR 1020. *Coreq:* FR 1020.

FR 1040 Basic French 4 (3) Intensive one-semester program combining FR 1010 and 1020 for students who have previously studied French. Includes fundamentals of grammar and vocabulary as a foundation for building written and oral proficiency. *Coreq:* FR 1041.

FR 1041 Basic French Laboratory 0 (1) Non-credit laboratory to accompany FR 1040. *Coreq:* FR 1040.

FR 1510 French for Graduate Students 3 (3) Intensive program only for graduate students preparing for the reading examination in French. A minimum grade of B on a final examination will satisfy graduate school foreign language requirement. May be repeated once for credit. To be taken Pass/No Pass only. *Preq:* Graduate standing.

FR 2010 Intermediate French 3 (3) Brief review of FR 1010 and 1020, with conversation, composition, and dictation, and the beginning of more serious reading of French prose. Includes literary and cultural perspectives. Includes Honors sections. *Preq:* FR 1020. *Coreq:* FR 2011.

FR 2011 Intermediate French Laboratory 0 (1) Non-credit laboratory to accompany FR 2010. *Coreq:* FR 2010.

FR 2020 Intermediate French 3 (3) Emphasizes reading nontechnical French prose more rapidly. Writing, speaking, and listening skills continue to be developed. Includes literary and cultural perspectives. Includes Honors sections. *Preq:* FR 2010. *Coreq:* FR 2021.

FR 2021 Intermediate French Laboratory 0 (1) Non-credit laboratory to accompany FR 2020. *Coreq:* FR 2020.

FR 2970 Creative Inquiry—French 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration. *Preq:* Consent of faculty member.

- FR 2990 Foreign Language Drama Laboratory I 3 (3)** Participation in foreign drama productions. No formal class meetings, but an average of three hours per week in a foreign language drama workshop for production. May be repeated for a maximum of three credits. *Preq:* Consent of instructor directing the play.
- FR 3000 Survey of French Literature 3 (3)** Study of selected masterpieces of French literature in their artistic, cultural, and historical context. May include theme and genre studies. *Preq:* FR 2020.
- FR 3040 French Short Story 3 (3)** Introduction to the study of French narrative literature and the elements of critical analysis through the examination of short stories spanning the medieval era to the present from both France and Francophone countries. *Preq:* FR 3050.
- FR 3050 Intermediate French Conversation and Composition I 3 (3)** Practice in the spoken language stressing vocabulary building, pronunciation, intonation, and comprehension. Requires written work to increase accuracy and assignments in the language laboratory. *Preq:* FR 2020.
- FR 3060 Intensive Language and Culture in Belgium 3 (3)** Intensive one-semester course for students participating in the Clemson French Immersion program in Belgium. Includes the study of language and Belgian cultural heritage with an emphasis on integration into local student life, immersion in contemporary Belgian society, and participation in cultural traditions. *Preq:* FR 3050.
- FR 3070 French Civilization 3 (3)** Study of significant aspects of French culture from its origins to the present. *Preq:* FR 3050.
- FR 3080 French Linguistics I: Phonetics, Phonology, and Morphology 3 (3)** Study of the fundamental sound patterns, melodic structure, and work-formation processes of modern standard French. *Preq:* FR 3040 or FR 3050.
- FR 3090 French Linguistics II: Syntax and Semantics 3 (3)** Study of the fundamental structures of French syntax and semantics. *Preq:* FR 3040 or FR 3050.
- FR 3100 Summer Immersion Program 6 (6)** Conducted entirely in French for eight hours daily, this summer immersion program consists of activities that combine interrelating cultural topics with language skill practice. Frequent opportunities to converse with native speakers during meals and on excursions. Students receive six credits, three of which may be taken in lieu of FR 2020. *Preq:* FR 2010.
- FR 3120 Writing in French I 3 (3)** Study of the vocabulary, syntax, and stylistics in short compositions and creative papers in French, on both fiction and non-fiction topics. *Preq:* FR 2020.
- FR 3160 French for International Trade I 3 (3)** Spoken and written French common to the French-speaking world of business and industry, emphasizing business practices and writing and translating business letters and professional reports. Cross-cultural references provide opportunity for comparative and contrastive analyses of American and French cultural patterns in a business setting. *Preq or concurrent enrollment:* FR 2020 and FR 3050.
- FR 3170 Contemporary French Civilization 3 (3)** Study of significant aspects of France today; the country, its economy, government, and society. Taught in French. *Preq:* FR 3050.
- FR 3200 Studies in French Theatre 3 (3)** Explores a variety of genres (medieval farce, classical comedy and tragedy, romantic melodrama, and the Nouveau Thibtre) with emphasis on staging. Class materials consist of scripts, videotaped performances, and theoretical readings on issues pertaining to spectacle in social, political, and artistic terms. May be repeated for a maximum of six credits. *Preq:* FR 2020.
- FR 3570 Selected Topics in the Culture of Paris 3 (3)** On-site study of Paris and its relationship to France and Europe through readings, lectures, field trips, small student-group explorations, and reporting sessions. All activities are conducted in French. *Preq:* FR 2020.
- FR 3630 French and Francophone Poetry 3 (3)** Study of traditions and major works of French and/or Francophone poetry in their historical, cultural, and aesthetic contexts. Topics may include genres, periods, traditions (romanticism, symbolism, cubism, surrealism), or themes. *Preq:* FR 3050.
- FR 3830 French-Language News 1 (1)** Weekly discussions of French-language news articles in the foreign press with an emphasis on politics and the connections among political, social, economic, and cultural trends. Emphasizes French vocabulary as well as cross-cultural contrasts with the United States. May be repeated for a maximum of three credits. *Preq:* FR 2020.
- FR 3910 Survey of French Literature (Honors) 1 (1)** One-hour independent study to allow honors students to pursue supervised research on a topic relating to the literary, cultural, and artistic movement in France. *Preq:* Membership in Calhoun Honors College. *Preq or concurrent enrollment:* FR 3000.
- FR 3970 Creative Inquiry—French 1-4 (1-4)** Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.
- FR 3980 Directed Reading 1-3 (1-3)** Directed study of selected topics in French literature, language, and culture. May be repeated for a maximum of six credits. *Preq:* Consent of department chair.
- FR 4000 Modern French Literature 3 (3)** Study of selected works of 20th-century French literature in their artistic, cultural, and historical context. *Preq:* FR 3050.
- FR 4090 Writing in French II 3 (3)** Intensive study of syntax and stylistics through composition and translations. *Preq:* Senior standing.
- FR 4100 Francophone Literature 3 (3)** Study of selected works of francophone literature emphasizing Africa and the Caribbean in their artistic, cultural, historical, and political contexts. *Preq:* FR 3050.
- FR 4110 Advanced French Conversation and Composition 3 (3)** Continuation of FR 3050 emphasizing greater fluency and sophistication in oral and written expression. *Preq:* FR 3050.
- FR 4120 French and Francophone Cinema 3 (2)** Examination of cinematic practice as a discourse and the role it plays in the representation of social relations, particularly race, ethnicity, class, power, sex, and gender in the French-speaking world. May include a study of major directors, genres, and movements. Taught in French. Films with English subtitles. *Preq:* FR 3050. *Coreq:* FR 4121.
- FR 4121 French and Francophone Cinema Laboratory 0 (3)** Non-credit laboratory to accompany FR 4120. *Coreq:* FR 4120.
- FR 4150 Translation Seminar 3 (3)** Methods and theory of translation and a comparison of French and English structures. Practical exercises in translating from French to English and vice versa in a variety of texts. *Preq:* FR 3050.
- FR 4160 French for International Trade II 3 (3)** Study of language and cultural environment of the French-speaking markets of the world, including the linguistic and cultural idioms that support global marketing in general and the international marketing of textiles, agricultural products, and tourism in particular. *Preq:* FR 3160.
- FR 4200 French Enlightenment, Revolution and Romanticism 3 (3)** Cultural and literary studies of the century and a half (1715–1851) in which France occupied the center stage of world history and its modern institutions came into being. Emphasizes the free intellectual inquiry championed by philosophers and the romantic melancholy in the aftermath of the Revolution. *Preq:* FR 3050.
- FR 4380 French Honors Research 3 (3)** Individual honors research conducted under the direction of Language Department faculty. May not be used to satisfy requirements for the major in Modern Languages—French or Language and International Trade or the minor in Modern Languages. *Preq:* Junior standing and membership in Calhoun Honors College.
- FR 4390 French Honors Thesis 3 (3)** Individual honors research conducted and thesis completed under the direction of Language Department faculty member. May not be used to satisfy requirements for the major in Modern Languages—French or Language and International Trade or the minor in Modern Languages. *Preq:* Junior standing and FR 4380 and membership in Calhoun Honors College.
- FR 4750 Advanced French Seminar 3 (3)** Concentrated research and discussion on an advanced topic in French literature, film, drama, music, or philosophy. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* FR 3040 or FR 3050 and Senior standing.
- FR 4760 Advanced Seminar on French Thought 3 (3)** Research and discussion of an advanced topic, text, or group of texts with a particular focus on French theory and philosophy but including works of French literature. Conducted in English. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Senior standing.
- FR 4770 Advanced Seminar on the French and Francophone Novel 3 (3)** Examination of the French novel and/or narrative prose focusing on a theme, genre, or period. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* FR 3040 or FR 3050 and Senior standing.

FR 4910 Modern French Literature (Honors) 1 (1)
Independent study to allow honors students to pursue in depth an author, work, movement, or genre related to contemporary French culture, art, or literature. *Preq or concurrent enrollment:* FR 4000 and membership in Calhoun Honors College.

FR 4920 The French Corporation (Honors) 1 (1)
Independent study to allow honors students to pursue an in-depth study of the organization, structure, functions, and economic role of a French business enterprise. *Preq or concurrent enrollment:* FR 4170 and membership in Calhoun Honors College.

FR 4970 Creative Inquiry—French 1-4 (1-4)
Continuation of research initiated in FR 3970. Students complete their projects and disseminate their research results. *Preq:* FR 3970.

FR 4980 Independent Study 1-3 (1-3) Directed study of a selected topic in French literature, language, or culture. May be repeated for a maximum of six credits. *Preq:* Consent of department chair.

FR 4990* Selected Topics in French Literature 3 (3) Selected topics that have characterized French literature, language, and culture. May be repeated for a maximum of six credits. *Preq:* Consent of department chair.

GRAPHIC COMMUNICATIONS

Professors: S.T. Ingram, J.M. Leininger, C.E. Tonkin, Chair; *Associate Professors:* E.M. Weisenmiller, N.L. Woolbright; *Assistant Professors:* L.H. O'Hara, C.T. Weiss; *Senior Lecturers:* C.D. Jones, P.G. Rose; *Lecturers:* K.T. Cox, E.B. Walker

GC 1010 Orientation to Graphic Communications 1 (1) Introduction to the curriculum and the industry, including its processes, products, and careers. Emphasizes the attributes most desirable for successful entry and advancement up a variety of career ladders.

GC 1020 Computer Art and CAD Foundations 4 (2) Graphic Communications industries make extensive use of software and best practices from concept through production. This course provides a solid foundation in drawing, imaging and layout software; packaging structure and 3-D CAD; design principles and problem solving relative to audience, need, typography, color, materials, printing and end use. Includes Honors sections. *Coreq:* GC 1021.

GC 1021 Computer Art and CAD Foundations Laboratory 0 (6) Non-credit laboratory to accompany GC 1020. *Coreq:* GC 1020.

GC 1030 Graphic Communications I for Packaging Science 4 (2) Emphasizes the interrelationships of packaging and graphic arts. Topics include theory and practice in packaging requirements relative to basic graphic arts concepts, principles, and practices; layout; design; electronic copy preparation; the printing processes of offset lithography; screen printing; gravure; and flexography. Includes digital and specialty printing processes, environmental, health, and safety concerns. *Coreq:* GC 1031.

GC 1031 Graphic Communications I for Packaging Science Laboratory 0 (6) Non-credit laboratory to accompany GC 1030. *Coreq:* GC 1030.

GC 1040 Graphic Communications I 4 (2)
Emphasizes basic graphic arts industry concepts, principles, and practices, with laboratory applications in graphic design, digital layout, image capture/manipulation, offset lithography, screen printing, flexography, digital printing variable data, finishing operations and color management. Also covers gravure, letterpress, and specialty printing processes, along with environmental, health, and safety concerns. Includes Honors sections. *Preq:* GC 1020. *Coreq:* GC 1041.

GC 1041 Graphic Communications I Laboratory 0 (6) Non-credit laboratory to accompany GC 1040. *Coreq:* GC 1040.

GC 1990 Creative Inquiry—Graphic Communications I 1-3 (1-3) Under the direction of a faculty member, students pursue approved scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. *Preq:* Freshman standing and consent of faculty member/mentor.

GC 2070 Graphic Communications II 4 (2)
Intermediate course for graphic communications and graphic arts specialists, which builds upon student experiences from previous courses. Emphasis is on theory and problem solving, as well as broadening skills in layout, copy preparation, lithographic and screen printing presswork. Additional areas of focus include typesetting imposition, basic electronic halftone theory, wide format technology and markets, basic methods for quality control, computer hardware, software, and networks and servers for the graphics industry. Includes Honors sections. *Preq:* GC 1010 and GC 1020 and GC 1040. *Coreq:* GC 2071.

GC 2071 Graphic Communications II Laboratory 0 (6) Non-credit laboratory to accompany GC 2070. *Coreq:* GC 2070.

GC 2400 Introduction to Web Design and Development 3 (2) Designed to build the students' knowledge of web design and development to an intermediate level. Students learn the fundamental languages and markups for front-end web programming, and are introduced to some of the more complex web topics, including Web to Print, Responsive Web Design, and Server Technology. *Preq:* GC 1020 and GC 1040. *Coreq:* GC 2401.

GC 2401 Introduction to Web Design and Development Laboratory 0 (3) Non-credit laboratory to accompany GC 2400. *Coreq:* GC 2400.

GC 2510 Special Projects in Graphic Communications I 1-3 (1-3) Advanced projects covering theory and/or practices beyond the scope of regular coursework. The subject of work is determined by the instructor in consultation with the student, usually before the term begins or shortly thereafter. The student is expected to work independently and at a level consistent with the amount of work normally associated with the specific credit hours enrolled in. Written project approval is required prior to registration. May be repeated for a maximum of six credits with approval of advisor. *Preq:* Sophomore standing and acceptance of written proposal by and consent of advisor.

GC 2990 Creative Inquiry—Graphic Communications II 1-3 (1-3) Under the direction of a faculty member, students pursue approved scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. *Preq:* Sophomore standing.

GC 3400 Digital Imaging and eMedia 4 (2) Centered around digital imaging, this course explores digital graphic communications photography, video and web design. The photography segment concentrates on manual camera capture; the video segment introduces the basic process of filmmaking; and the web segment covers basic coding and design. Online marketing tools and social media are also explored. *Preq:* GC 1020 and GC 1040. *Coreq:* GC 3401.

GC 3401 Digital Imaging and eMedia Laboratory 0 (6) Non-credit laboratory to accompany GC 3400. *Coreq:* GC 3400.

GC 3460 Ink and Substrates 3 (2) Emphasizes basic graphic arts industry concepts, principles and practices, with laboratory applications in graphics. This course provides an in-depth study of the properties of inks and substrates used in offset lithography, flexography, gravure, screen printing and digital printing applications. The interrelationship between inks, substrates and printing is examined. *Preq:* GC 2070. *Coreq:* GC 3461.

GC 3461 Ink and Substrates Laboratory 0 (3) Non-credit laboratory to accompany GC 3460. *Coreq:* GC 3460.

GC 3500 Graphic Communications Internship I 1 (3) Full-time supervised employment in an industrial in-plant setting for expansion of experience with materials and processes, production people, and organizations. *Preq:* GC 1040 and Graphic Communications major and consent of instructor. *Preq or concurrent enrollment:* COOP 2010.

GC 3510 Special Projects in Graphic Communications II 1-3 (1-3) Advanced projects covering theory and/or practices beyond the scope of regular coursework. The subject of work is determined by the instructor in consultation with the student, usually before the term begins or shortly thereafter. The student is expected to work independently and at a level consistent with the amount of work normally associated with the specific credit hours enrolled in. Written project approval is required prior to registration. May be repeated for a maximum of six credits with approval of advisor. *Preq:* Junior standing and acceptance of written proposal by and consent of advisor.

GC 3990 Creative Inquiry—Graphic Communications III 1-3 (1-3) Under the direction of a faculty member, students pursue approved scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. *Preq:* Junior standing and consent of faculty member/mentor.

- GC 4060* Package and Specialty Printing 4 (2)** In-depth study of the problems and processes for printing and converting in package label and specialty printing industries. Flexographic prepress, workflow, proofing, printing, die making, die cutting, converting, inventory marks, and consumer experience graphics are covered. New developments and trends are explored as well. Laboratory techniques in prepress, printing and converting. Includes Honors sections. *Preq:* GC 3400. *Coreq:* GC 4061.
- GC 4061* Package and Specialty Printing Laboratory 0 (6)** Non-credit laboratory to accompany GC 4060. *Coreq:* GC 4060.
- GC 4070* Advanced Flexographic Methods 4 (2)** In-depth study of the methods used in flexographic printing and converting of porous and nonporous substrates. Theory and laboratory applications include setting standards for process color, preparation of plate systems, ink mixing and color matching, testing of films and foils, analysis of recent developments, and prediction of future markets. *Preq:* GC 4060. *Coreq:* GC 4071.
- GC 4071* Advanced Flexographic Methods Laboratory 0 (6)** Non-credit laboratory to accompany GC 4070. *Coreq:* GC 4070.
- GC 4400* Commercial Printing 4 (2)** Advances skills learned in previous graphic communications courses and applies the knowledge to large format presses. Students work from the design conception stage through all aspects of preparation, production, and finishing. Emphasizes understanding and incorporating emerging technologies into the production workflow. Includes Honors sections. *Preq:* GC 3400. *Coreq:* GC 4401.
- GC 4401* Commercial Printing Laboratory 0 (6)** Non-credit laboratory to accompany GC 4400. *Coreq:* GC 4400.
- GC 4440* Current Developments and Trends in Graphic Communications 4 (2)** Advanced course for Graphic Communications majors. Emphasizes the theory and technical developments that affect process and equipment selection. Topics include color theory and application, electronic color scanning, electronic prepress and communications, gravure color quality control and analysis. Includes Honors sections. *Preq:* GC 4060 and GC 4400. *Coreq:* GC 4441.
- GC 4441* Current Developments and Trends in Graphic Communications Laboratory 0 (6)** Non-credit laboratory to accompany GC 4440. *Coreq:* GC 4440.
- GC 4450* Advanced Screen Printing Methods 3 (2)** In-depth study of the systems and materials used with the screen printing process. Emphasizes techniques of control and procedures for establishing screen printing methods and standards. *Preq:* GC 2070. *Coreq:* GC 4451.
- GC 4451* Advanced Screen Printing Methods Laboratory 0 (3)** Non-credit laboratory to accompany GC 4450. *Coreq:* GC 4450.
- GC 4480* Planning and Controlling Printing Functions 3 (2)** Study of systems for setting printing production standards, estimating, scheduling, job planning, and the selection of new hardware and technologies. Includes Honors sections. *Preq:* GC 3500 and GC 4060 and GC 4400 and GC 4500. *Coreq:* GC 4481.
- GC 4481* Planning and Controlling Printing Functions Laboratory 0 (3)** Non-credit laboratory to accompany GC 4480. *Coreq:* GC 4480.
- GC 4500 Graphic Communications Internship II 1 (3)** Continuation of GC 3500. *Preq:* GC 3500; and either GC 4060 or GC 4400. *Preq or concurrent enrollment:* COOP 2020.
- GC 4510 Special Projects in Graphic Communications 1-6 (1-6)** Advanced projects covering theory and/or practices going beyond the scope of regular coursework. Written project approval is required before registering. May be repeated for a maximum of six credits with advisor's approval. Includes Honors sections. *Preq:* Junior standing and completion of three graphic communications courses.
- GC 4550 Advanced Graphic Communications Internship 1 (3)** Full-time employment in an industry directly or indirectly related to printing. Work site and job must be approved in advance. *Preq:* GC 3500 and consent of instructor.
- GC 4800 Senior Seminar in Graphic Communications 2 (2)** Study of current trends and issues in the graphic communications industry. Class centers around group discussions dealing with relevant topics facing the graphic communications manager today. Students draw upon academic experiences, internship experiences, and library research to facilitate discussion. Must be taken during student's last semester on campus. *Preq:* GC 4500.
- GC 4900* Graphic Communications Selected Topics 1-3 (1-3)** Subjects not covered in other graphic communications courses; organized according to industry trends and student needs. May be repeated for a maximum of 18 credits, but only if different topics are covered. *Preq:* Consent of instructor.
- GC 4990 Creative Inquiry—Graphic Communications IV 1-3 (1-3)** Under the direction of a faculty member, students pursue approved scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. *Preq:* Senior standing.

GENETICS

Professors: W. Cao, J. Frugoli, S. Kresovich, H. Luo, W.R. Marcotte, *Chair*; J. Morris, K.S. Smith; *Associate Professors:* F.A. Feltus, A. Lawton-Rauh, H. Liang, K. Paul, M. Sehorn, L.J. Wang; *Assistant Professors:* L.A. Clark, C. Ingram-Smith, L. Kozubowski, M.T. Morris; R. Sekhon; *Lecturers:* S. Chandrasekaran, A. Starr-Moss, K. Tsai

GEN 1030 Careers in Biochemistry and Genetics 1 (1) Introduction to biochemistry and genetics career paths, professional organizations, ethical issues, and requirements for advanced study. Also gives students training in design of a professional portfolio. Students may not receive credit for both BCHM 1030 and GEN 1030. *Preq:* Biochemistry or Genetics major.

GEN 3000 Fundamental Genetics 3 (3) Introductory course covering fundamental principles of genetics in prokaryotes and eukaryotes. Emphasizes Mendelian genetics, physical and chemical basis of heredity, and population genetics. *Preq:* BIOL 1030 or BIOL 1100.

GEN 3020 Molecular and General Genetics 3 (3) Rapidly-paced course covering Mendelian and molecular genetics, with introductory coverage of quantitative and population genetics. Emphasizes the molecular basis of heredity and gene expression in prokaryotes and eukaryotes and modern genetic technology. Includes Honors sections. *Preq:* BIOL 1100 with C or better.

GEN (BCHM) 3040 Molecular Biology Laboratory 2 (4) Introduces fundamental molecular biology laboratory techniques commonly used in biochemistry, genetics, and molecular biology research. Principles and applications of these techniques are also discussed. May also be offered as BCHM 3040. *Preq:* BIOL 1100. *Preq or concurrent enrollment:* BCHM 3010 or GEN 3020.

GEN (BIOL) 4050* Molecular Genetics of Eukaryotes 3 (3) Molecular genetic analyses of eukaryotes in relation to mutations and repair, complex phenotypes, biochemical pathways, short- and long-term regulation of gene expression, and evolution. May also be offered as BIOL 4050. *Preq:* BCHM 3010 or BCHM 3050; and GEN 3000 and GEN 3020.

GEN 4100* Population and Quantitative Genetics 3 (3) Classical and computational genetics topics, including Mendelian vs. non-Mendelian inheritance, genetic variation, evolutionary, conservation, coalescent theory, molecular evolution, quantitative trait locus, and association mapping in the framework of population and quantitative genetics. Includes Honors sections. *Preq:* STAT 2300 and GEN 3020, each with C or better.

GEN 4110* Population and Quantitative Genetics Laboratory 2 (4) Crosses are performed using eukaryotic organisms with appropriate markers, and molecular markers are amplified, sequenced, and analyzed. Collected data are used to test hypotheses regarding possible modes of inheritance and for patterns of molecular evolution. Population and molecular evolutionary genetics concepts are also examined. *Preq or concurrent enrollment:* GEN 4100.

GEN 4200* Molecular Genetics and Gene Regulation 3 (3) Molecular genetics, including replication, transcription and translation, gene expression, recombinant DNA technology, developmental, human, cancer, and behavioral genetics. Includes Honors sections. *Preq:* BCHM 3010 and GEN 3020, each with C or better.

GEN 4210 Molecular Genetics and Gene Regulation Laboratory 2 (4) Explores molecular genetics techniques (transformation, cloning, PCR, gel electrophoresis, Southern Blotting, reporter genes, gene mapping) using prokaryotic and eukaryotic organisms. *Preq or concurrent enrollment:* GEN 4200.

GEN (BCHM) 4400* Bioinformatics 3 (3) Theory and application of computational technology to analysis of the genome, transcriptome, and proteome. Includes Honors sections. May also be offered as BCHM 4400. *Preq:* BCHM 3010 or BCHM 3050 or GEN 3000 or GEN 3020, with C or better.

GEN 4500* Comparative Genetics 3 (3) Outlines the genome structure, function, and evolution based on available complete genome sequences. Topics include the evolution of multigene families, origin of eukaryotic organelles, molecular phylogeny, gene duplication, domain shuffling, transposition, and horizontal gene transfer. Includes Honors sections. *Preq:* GEN 4200 with a C or better. *Preq or concurrent enrollment:* GEN 4400.

GEN 4700* Human Genetics 3 (3) Basic principles of inheritance; population, molecular and biochemical genetics; cytogenetics; immunogenetics; complex traits; cancer genetics; treatment of genetic disorders; genetic screening and counseling; and the Human Genome Project. *Preq:* GEN 3000 with a C or better; or GEN 3020 with C or better.

GEN 4900 Selected Topics in Genetics 1-4 (1-4) Comprehensive study of selected topics not covered in other courses. May be repeated for a maximum of eight credits, but only if different topics are covered. *Preq:* Consent of instructor.

GEN 4910 Directed Research in Genetics 1-8 (3-24) Orientation in genetic research (i.e. experimental planning, execution, and reporting). May be repeated for a maximum of 20 credits. Includes Honors sections. *Preq:* Consent of instructor.

GEN 4920 Honors Thesis in Genetics 1 (1) Students complete a senior thesis and oral presentation detailing their honors research in genetics. *Preq or concurrent enrollment:* Students are expected to have completed or be concurrently enrolled in their second semester of an Honors section of GEN 4910 for a minimum of four credits when registering for this course.

GEN 4930 Senior Seminar 2 (2) Analysis and discussion of papers from the primary literature in the life sciences particularly in genetics. Students find pertinent articles in the primary literature and present and analyze the selected reading. Includes Honors sections. *Preq:* BCHM 3010 and GEN 3020, each with a C or better; and one of the following with a C or better: GEN 4100 or GEN 4200 or GEN 4500.

GEN (ENT) 4950* Insect Biotechnology 3 (3) Considers many unique genetic features exhibited by insects and describes the applications of biotechnology to enhance useful products from insects and to affect the control of destructive insects. May also be offered as ENT 4950. *Preq:* ENT 3010 and GEN 3020.

GEOGRAPHY

Associate Professor: C.A. Smith; *Assistant Professor:* W.C. Terry; *Lecturer:* L.F. Howard

GEOG 1010 Introduction to Geography 3 (3) Survey of the nature of geography emphasizing the discipline's organizing themes of earth science, relations between people and their environments, interrelations between places, locational analysis, and area studies.

GEOG 1030 World Regional Geography 3 (3) Systematic and descriptive survey of the major regions of the world, including their physical and cultural features. Provides a global context for courses in the social sciences and humanities.

GEOG 1060 Geography of the Physical Environment 4 (3) Examines the condition of the physical environment, especially the earth's surface and the processes that act on it. Topics range from earth-sun relations to the evolution of landscapes; human habitats and human alteration of the environment. *Coreq:* GEOG 1061.

GEOG 1061 Geography of the Physical Environment Laboratory 0 (3) Non-credit laboratory to accompany GEOG 1060. *Coreq:* GEOG 1060.

GEOG 3010 Political Geography 3 (3) Geographic basis of states: sovereignty, territory, power within states, relations between states. The geography of international affairs. *Preq:* GEOG 1010 or GEOG 1030.

GEOG 3020 Economic Geography 3 (3) Spatial analysis of economic activity emphasizing regional economics and development. Topics include world population; technology and economic development; principles of spatial interaction; and geography of agriculture, energy manufacturing, and tertiary activities. *Preq:* GEOG 1010 or GEOG 1030.

GEOG 3030 Urban Geography 3 (3) Historical and contemporary survey of the urban world, with particular attention paid to the relationship between people and urban places. Topics include the rise of cities, urban hierarchies, urban land use, and the social geography of cities. *Preq:* GEOG 1010 or GEOG 1030.

GEOG 3050 Cultural Geography 3 (3) Broad examination of the basic cultural variables in the human occupation of the earth using ecological, spatial, regional, and historical approaches. Topics vary but may include cultural areas and distributions, cultural change, cultural landscape, and cultural ecology. *Preq:* GEOG 1010 or GEOG 1030.

GEOG 3060 Historical Geography 3 (3) Exploration of geographical change and the varied patterns of past human activities and people's relationships with the physical environment. Case studies from around the world are used to emphasize key themes in historical geography. *Preq:* GEOG 1010 or GEOG 1030.

GEOG 3300 Geography of the Middle East and North Africa 3 (3) Thematic survey of a world region extending from Morocco to Afghanistan. Emphasizes climate, environment, social geography, historical development of the regional culture of Islam, and common problems facing the area today. *Preq:* GEOG 1010 or GEOG 1030.

GEOG 3400 Geography of Latin America 3 (3) Introduction to the physical, economic, political, and human/cultural geography of Latin America. Special focus is on regional unity and diversity and the historical interaction of man and environment.

GEOG 3600 Geography of Africa 3 (3) Study of how tropical, or sub-Saharan, Africa functions in the modern world. Africa's physical environments, peoples and cultures, colonial and post-colonial history, and ideologies of economic development. Five basic themes are covered: population, natural resources, environmental quality, political organization, economic development. *Preq:* GEOG 1010 or GEOG 1030.

GEOG 3990 Creative Inquiry—Geography 1-3 (1-3) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of nine credits. *Preq:* GEOG 1010 or 1030.

GEOG 4010* Studies in Geography 3 (3) Intensive study of the geography of a selected world region, such as North America, Europe, or the Middle East, or the geography of a topic, such as the geography of oil or the geography of underdevelopment. May be repeated once for credit with departmental consent. *Preq:* GEOG 1010 or GEOG 1030.

GEOG 4100* Geography of the American South 3 (3) Study of the geography of the American South in its changing complexities across almost 400 years of development. *Preq:* GEOG 1010 or GEOG 1030.

GEOG 4200* Historical Geography of the United States 3 (3) Survey that places the spatial concepts of geography into a time sequence with special emphasis upon the United States. *Preq:* GEOG 1010 or GEOG 1030.

GEOG (PRTM) 4300* World Geography of Parks and Equivalent Reserves 3 (3) Major international patterns in the provision and use of urban and rural parks and recreation are examined. May also be offered as PRTM 4300. *Preq:* 2.0 cumulative grade-point average.

GEOG 4400* Geography of Historic Preservation 3 (3) Aspects of historic preservation emphasizing sites and structures in their geographical, historical, and socioeconomic contexts. Examples are drawn from American architectural styles and settlement forms. *Preq:* GEOG 1010 or GEOG 1030.

GEOG 4990 Independent Study in Geography 3 (0) Study of selected topics in geography under the direction of a faculty member chosen by the student. Student and faculty member develop a course of study designed for the individual student and approved by the department chair prior to registration.

GEOLOGY

Professors: J.W. Castle, L.C. Murdoch, M.A. Schlautman; *Associate Professors:* S.M. Moysey, B.A. Powell; *Assistant Professor:* L. Shuller-Nickels; *Lecturers:* S. Brame, A. Coulson

GEOL 1000 Current Topics in Geology 1 (1) Lectures and demonstrations covering topics of current interest in the different fields of geology. Recent research developments and career opportunities in the geosciences are emphasized.

GEOL 1010 Physical Geology 3 (3) Study of the minerals and rocks that compose earth's crust, their origins and transformations. Emphasizes geological processes, both internal and external, by which changes are produced on or in the earth. Includes Honors sections.

GEOL 1030 Physical Geology Laboratory 1 (2) Laboratory to accompany GEOL 1010. Provides instruction in the identification of minerals and rocks and in the interpretation of geologic processes through study of topographic maps. Field trips provide direct observation of processes and results. Includes Honors sections. *Preq or concurrent enrollment:* GEOL 1010.

- GEOL 1120 Earth Resources 3 (3)** Survey of earth's mineral, energy, water, and land resources and environmental and societal impacts associated with the use of these resources.
- GEOL 1140 Earth Resources Laboratory 1 (2)** Laboratory to accompany GEOL 1120. Provides instruction in the identification of ore and gem minerals and of other earth materials of economic importance. Land and water resources are explored through the use of topographic maps, aerial photographs, remotely sensed images, and field trips.
- GEOL 1200 Natural Hazards 3 (3)** This class explains the scientific causes of various natural hazards (earthquakes, volcanoes, hurricanes, tsunamis, etc.) Additionally, topics explore how economic, social, and political factors influence our preparedness for and response to disasters. Discussions also examine moral dilemmas resulting from technological limits on our ability to predict and prevent such events.
- GEOL (ENSP) 1250 Sustainable Resource Use 3 (3)** This course explores the challenges our society faces in making the transition to renewable resource use in a way that is truly sustainable environmentally, economically and socially. The conflicting demands of each system will be examined and used to critically examine possible solutions using a systems based approach. May also be offered as ENSP 1250.
- GEOL 2020 Earth History 4 (3)** Survey of the earth's geologic history emphasizing how the continents and ocean basins have evolved through geologic time. Evolution of life from the beginning of the fossil record through the present; identification of fossil plants and animals and interpretation of earths past through study of geologic maps. Field trips illustrate principles. Includes Honors sections. *Preq:* GEOL 1010 and GEOL 1030. *Coreq:* GEOL 2021.
- GEOL 2021 Earth History Laboratory 0 (3)** Non-credit laboratory to accompany GEOL 2020. *Coreq:* GEOL 2020.
- GEOL 2050 Mineralogy and Introductory Petrology 3 (3)** Includes crystal symmetry and introduction to x-ray crystallography, composition and stability of minerals, survey of common rock-forming minerals, petrological classification of rocks and introduction to rock associations. *Preq:* GEOL 1010 and 1030. *Preq or concurrent enrollment:* CH 1010. *Coreq:* GEOL 2070.
- GEOL 2070 Mineralogy and Introductory Petrology Laboratory 1 (3)** Identification of rock-forming minerals and important ore minerals based on their physical properties. Includes hand specimen petrology of igneous, sedimentary, and metamorphic rocks. Credit toward a degree will be given for only one of GEOL 2070 or GEOL 2080. *Coreq:* GEOL 2050.
- GEOL 2080 Mineralogy and Petrography Laboratory 2 (6)** Identification of rock-forming minerals and important ore minerals based on their physical and optical properties. Hand specimen petrology and petrography of igneous, sedimentary, and metamorphic rocks. Study of minerals in thin section using polarizing microscope. Credit toward a degree will be given for only one of GEOL 2070 or 2080. *Preq or concurrent enrollment:* GEOL 2050.
- GEOL 2100 Geology of the National Parks 3 (3)** Survey of selected national parks and monuments emphasizing the dynamic geological processes that have shaped the landscapes of these areas. Special attention is focused on parks exhibiting recent geological activity related to volcanoes, earthquakes, and glaciers. Slides and films are used to highlight specific geological features.
- GEOL 2110 Geoanalysis I 4 (3)** Students develop a working knowledge of statistical methods used to formulate and solve problems in the earth sciences. Emphasis is on sampling methods and experimental design for geologic settings and on formulating and evaluating hypotheses using statistical inference of data sets. *Preq or concurrent enrollment:* MATH 1080. *Coreq:* GEOL 2111.
- GEOL 2111 Geoanalysis I Laboratory 0 (3)** Non-credit laboratory to accompany GEOL 2110. *Coreq:* GEOL 2110.
- GEOL 2120 Geoanalysis II 4 (3)** Students develop a working knowledge of deterministic methods used to formulate and solve problems in the earth sciences. Emphasis is on developing conceptual models from geologic field observations, formulating idealized problems, and analyzing and interpreting solutions. Special focus is on using computer software to support analyses. *Preq:* GEOL 2110 and MATH 1080. *Coreq:* GEOL 2121.
- GEOL 2121 Geoanalysis II Laboratory 0 (3)** Non-credit laboratory to accompany GEOL 2120. *Coreq:* GEOL 2120.
- GEOL (ASTR) 2200 Planetary Science 3 (3)** Survey of the formation and evolution of planetary bodies. Emphasizes the origin of planetary material and comparative study of the primary processes operative on planetary surfaces. Describes major features of the planets and moons in our solar system, as revealed by recent space missions. May also be offered as ASTR 2200.
- GEOL 2700 Experiences in Sustainable Development: Water 3 (3)** Integrates cross-disciplinary perspectives on sustainability through active student participation in real-world development projects. Focuses on identifying and overcoming environmental, technical, social/organizational, and economic barriers to the sustainability of water resources. Emphasizes small-scale international water resources development.
- GEOL 2750 Field Methods 3 (1)** Introduction to geologic field methods, emphasizing traditional and emerging techniques. Students gain competency in using standard mapping tools, making appropriate measurements, mapping geologic formations found in the Piedmont and Blue Ridge, converting field data to digital format, making geologic maps, and presenting their data in accepted formats. *Preq:* GEOL 1010. *Coreq:* GEOL 2751.
- GEOL 2751 Field Methods Laboratory 0 (4)** Non-credit laboratory to accompany GEOL 2750. *Coreq:* GEOL 2750.
- GEOL 2910 Introduction to Research I 1 (1)** Required group learning and research experience for Geology majors (open to others with consent of instructor). Introduction to problem solving through case studies and interdisciplinary team approaches. Focus is on, but not limited to, research approaches in geology. Social and ethical contexts, communication skills, and professional development are incorporated.
- GEOL 2920 Introduction to Research II 1 (1)** Required group learning and research experience for Geology majors (open to others with consent of instructor). Introduction to problem solving through case studies and interdisciplinary team approaches. Focus is on, but not limited to, research approaches in geology. Social and ethical contexts, communication skills, and professional development are incorporated. *Preq:* GEOL 2910.
- GEOL 3000 Environmental Geology 3 (3)** Discussion-oriented introduction to relationships of man to his physical surroundings and problems resulting from upsetting the established equilibria of geologic systems; man's role as a geologic agent, environmental conservation and management. Includes Honors sections. *Preq:* GEOL 1010.
- GEOL 3020 Structural Geology 4 (3)** Diverse geological structures of the earth, their description, origin, and field recognition. Practical problems in interpreting geologic structures are utilized, in addition to theoretical considerations of the mechanics and causes of tectonism. Includes Honors sections. *Preq:* GEOL 2020. *Coreq:* GEOL 3021.
- GEOL 3021 Structural Geology Laboratory 0 (3)** Non-credit laboratory to accompany GEOL 3020. *Coreq:* GEOL 3021.
- GEOL 3130 Sedimentology and Stratigraphy 4 (3)** Topics include origin, composition, and texture of sediments and sedimentary rocks; sedimentation processes, depositional environments, facies relationships, and diagenesis; introduction to stratigraphic methods and geochronology. Laboratory involves description and classification of hand specimens and thin sections and analytical methods. *Preq:* GEOL 2050. *Coreq:* GEOL 3131.
- GEOL 3131 Sedimentology and Stratigraphy Laboratory 0 (3)** Non-credit laboratory to accompany GEOL 3130. *Coreq:* GEOL 3130.
- GEOL 3140 Sedimentary Petrology 3 (2)** Origin, composition, and texture of sediments and sedimentary rocks, including both siliciclastic and chemical varieties. Interpretation of tectonic settings, depositional systems, facies relationships, and diagenesis. Laboratory involves description and classification of hand specimens and thin sections and analytical methods. Includes Honors sections. *Preq:* GEOL 2050. *Coreq:* GEOL 3141.
- GEOL 3141 Sedimentary Petrology Laboratory 0 (3)** Non-credit laboratory to accompany GEOL 3140. *Coreq:* GEOL 3140.
- GEOL 3160 Igneous and Metamorphic Petrology 3 (2)** Classification, occurrence, and origin of igneous and metamorphic rocks. Discussion of the chemical and physical processes involved in magmatic crystallization and metamorphism. Laboratory study of igneous and metamorphic rocks in hand specimen and thin section. Includes Honors sections. *Preq:* GEOL 2050. *Coreq:* GEOL 3161.

- GEOL 3161 Igneous and Metamorphic Petrology Laboratory 0 (3)** Non-credit laboratory to accompany GEOL 3160. *Coreq:* GEOL 3160.
- GEOL 3180 Introduction to Geochemistry 3 (3)** Introduction to distribution of elements in the core, mantle, and crust of the earth. Control of rock type on trace element content in soils and sediments. Weathering; soil and regolith formation; water-sediment interrelations; solubility, mobility and bioavailability in relation to redox, pH and complexation; biogeochemical cycles of selected elements. *Preq:* GEOL 2050.
- GEOL 3600 Geology and Castles of Scotland 3 (1)** Students spend two weeks in Scotland exploring its diverse geology and visiting medieval castles and ancient stone mountains. Highlights include studying the unconformity at Siccar Point made famous by James Hutton, the father of modern geology; and travelling "The Rock Route" through the Scottish Highlands, where modern ideas about mountain building were birthed. *Coreq:* GEOL 3601.
- GEOL 3601 Geology and Castles of Scotland Laboratory 0 (4)** Non-credit laboratory to accompany GEOL 3600. *Coreq:* GEOL 3600.
- GEOL 3700 Western United States Field Study 3 (1)** Field excursion to a geologic region in the western United States. Students visit sites where the stratigraphy and structure are well exposed, studying a variety of landforms and the geologic processes responsible for their formation. Pre-trip sessions are held on campus. Additional fees are required. May be repeated for a maximum of six credits. *Preq:* GEOL 1010. *Coreq:* GEOL 3701.
- GEOL 3701 Western United States Field Study Laboratory 0 (4)** Non-credit laboratory to accompany GEOL 3700. *Coreq:* GEOL 3700.
- GEOL 3750 Bahamian Field Study 3 (1)** Students develop an understanding of Bahamian geology, culture, and social structure (including the influences of historical context and natural environments). Students stay one week on Andros Island in the Bahamas, traveling by van and boat to various sites. Additional fees are required. Includes Honors sections. *Preq:* GEOL 1010. *Coreq:* GEOL 3751.
- GEOL 3751 Bahamian Field Study Laboratory 0 (4)** Non-credit laboratory to accompany GEOL 3750. *Coreq:* GEOL 3750.
- GEOL 3910 Research Methods I 2 (2)** Required group learning and research experience for Geology majors (open to others with consent of instructor). Introduction to problem solving through case studies and interdisciplinary team approaches. Focus is on, but not limited to, research methods in geology. Social and ethical contexts, communication skills, and professional development are incorporated. *Preq or concurrent enrollment:* GEOL 2910.
- GEOL 3920 Research Methods II 2 (2)** Required group learning and research experience for Geology majors (open to others with consent of instructor). Introduction to problem solving through case studies and interdisciplinary team approaches. Focus is on, but not limited to, research methods in geology. Social and ethical contexts, communication skills, and professional development are incorporated. *Preq:* GEOL 3910. *Preq or concurrent enrollment:* GEOL 2910.
- GEOL 4030* Invertebrate Paleontology 3 (2)** Study of life of past geologic ages as shown by fossilized remains of ancient animals, with emphasis on the invertebrates. *Preq:* GEOL 1020. *Coreq:* GEOL 4031.
- GEOL 4031* Invertebrate Paleontology Laboratory 0 (3)** Non-credit laboratory to accompany GEOL 4030. *Coreq:* GEOL 4030.
- GEOL 4050* Surficial Geology 4 (3)** Study of surface features of the earth and the processes that produce them. Analysis of landforms including their form, nature, origin, development, and rates and patterns of change. Laboratory studies emphasize terrain analysis and the mechanics of surficial geological processes. *Preq:* GEOL 1020 and GEOL 3000. *Coreq:* GEOL 4051.
- GEOL 4051* Surficial Geology Laboratory 0 (3)** Non-credit laboratory to accompany GEOL 4050. *Coreq:* GEOL 4050.
- GEOL 4090* Environmental and Exploration Geophysics 4 (3)** Students develop an understanding of the principles and methods used to acquire, analyze, and interpret geophysical data. Emphasis on seismic/radar, gravimetric, and electromagnetic methods. Applications to hydrogeology, environmental engineering and science, soil science, contaminant transport and remediation, near surface geology, geotechnical problems, oil and gas exploration, and carbon sequestration. Includes Honors sections. *Preq:* At least Junior standing. *Coreq:* GEOL 4091.
- GEOL 4091* Environmental and Exploration Geophysics Laboratory 0 (3)** Non-credit laboratory to accompany GEOL 4090. *Coreq:* GEOL 4090.
- GEOL 4110 Research Problems 1-3 (1-3)** Field, laboratory, or library study of an approved topic in geology. Topic would be one not normally covered in formal courses, but may be an extension of a course. Taught either semester. May be repeated for a maximum of six credits. Includes Honors sections. *Preq:* Consent of instructor.
- GEOL 4130* Stratigraphy 3 (2)** Analysis of stratified rocks as the repository of earth history and the conceptual framework used to synthesize the world geologic record as a coherent whole. Emphasizes not only traditional lithostratigraphy but also modern seismic stratigraphy, biostratigraphy, magnetostratigraphy, and current stratigraphic issues. *Preq:* GEOL 3140. *Coreq:* GEOL 4131.
- GEOL 4131* Stratigraphy Laboratory 0 (2)** Non-credit laboratory to accompany GEOL 4130. *Coreq:* GEOL 4130.
- GEOL 4150* Analysis of Geological Processes 4 (3)** Introduction to methods for analyzing geological processes. Mathematical methods are introduced to solve problems related to stream flow, reaction kinetics, radioactive decay, heat flow, diffusion, fluid flow through geologic media and related processes. *Preq:* MATH 1080. *Coreq:* GEOL 4151.
- GEOL 4151 Analysis of Geological Processes Laboratory 0 (3)** Non-credit laboratory to accompany GEOL 4150. *Coreq:* GEOL 4150.
- GEOL 4210* GIS Applications in Geology 3 (1)** Introduction to geographic information systems with applications to current geological and hydrological problems. Topics include the use of global positioning systems, spatial analysis, and image analysis. Hands-on training with geographic information systems software and techniques is covered in lab. *Preq:* At least Junior standing. *Coreq:* GEOL 4211.
- GEOL 4211* GIS Applications in Geology Laboratory 0 (4)** Non-credit laboratory to accompany GEOL 4210. *Coreq:* GEOL 4210.
- GEOL 4510* Selected Topics in Hydrogeology 1-4 (1-3)** Selected topics in hydrogeology emphasizing new developments in the field. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Consent of instructor. *Coreq:* GEOL 4511.
- GEOL 4511* Selected Topics in Hydrogeology Laboratory 0 (1-3)** Non-credit laboratory to accompany GEOL 4510. *Coreq:* GEOL 4510.
- GEOL 4590* Biogeochemistry 3 (3)** Examines how biology directs mass and energy transfer between the lithosphere, biosphere, hydrosphere, and atmosphere. Scale of examination ranges from molecular to global. Topics include element cycling, the mineral-microbe/plant interface, biomineralization, and biogeochemical applications to bioremediation, ecology, environmental toxicology, and biotechnology. *Preq:* GEOL 3180; and CH 2010 or CH 2230.
- GEOL 4750 Summer Geology Field Camp 6 (10)** Introduction to field techniques emphasizing methods applied to hydrogeology. Includes description and mapping of hydrogeologic units and structures using outcrop data and lithologic and geophysical well logs. Also covers construction of potentiometric maps from water level data, performance of pumping tests on mapped aquifers, and analysis of data to determine aquifer characteristics. *Preq:* GEOL 2050 and GEOL 3020.
- GEOL (CE) 4820* Groundwater and Contaminant Transport 3 (3)** Basic principles of groundwater hydrology and transport of contaminants in groundwater systems; groundwater system characteristics; steady and transient flow; well hydraulics, design, and testing; contaminant sources, movement and transformations. May also be offered as CE 4820. *Preq:* Junior standing in the College of Engineering and Science and GEOL 1010.
- GEOL (ETOX, PES) 4850* Environmental Soil Chemistry 3 (3)** Study of soil chemical processes (sorption, desorption, ion exchange, precipitation, dissolution, and redox reactions) of nutrients and inorganic and organic contaminants in soils and organic matter. Chemical complex equilibria and adsorption phenomena at the solid (soil, sediment, and mineral) water interface are emphasized. May also be offered as ETOX 4850 or PES 4850. *Preq:* CH 1020 or PES 2020.

GEOL 4910 Research Synthesis I 3 (2) Required capstone group learning and research experience for Geology majors (open to others with consent of instructor). Involves synthesis of applied geology and other approaches for problem solving through collaborative teams. Course is the culmination of a sequence of case studies incorporating social and ethical contexts, communication skills, and professional development. *Preq:* GEOL 3920. *Coreq:* GEOL 4911.

GEOL 4911 Research Synthesis I Laboratory 0 (3) Non-credit laboratory to accompany GEOL 4910. *Coreq:* GEOL 4910.

GEOL 4920 Research Synthesis II 3 (2) Required capstone group learning and research experience for Geology majors (open to others with consent of instructor). Involves synthesis of applied geology and other approaches for problem solving through collaborative teams. Course is the culmination of a sequence of case studies incorporating social and ethical contexts, communication skills, and professional development. *Preq:* GEOL 4910. *Coreq:* GEOL 4921.

GEOL 4921 Research Synthesis II Laboratory 0 (3) Non-credit laboratory to accompany GEOL 4920. *Coreq:* GEOL 4920.

GERMAN

Professor: G.J. Love; *Associate Professor:* J. Schmidt; *Assistant Professor:* G. Stoicea; *Lecturers:* L.Ferrell, H. King

GER 1010 Elementary German 4 (3) Course for beginners in which, through conversation, composition, and dictation, the fundamentals of the language are taught and a foundation is provided for further study and the eventual ability to read and speak the language. Three hours a week of classroom instruction and one hour a week in the language laboratory. *Coreq:* GER 1011.

GER 1011 Elementary German Laboratory 0 (1) Non-credit laboratory to accompany GER 1010. *Coreq:* GER 1010.

GER 1020 Elementary German 4 (3) Continuation of GER 1010; three hours a week of classroom instruction and one hour a week in the language laboratory. *Coreq:* GER 1021.

GER 1021 Elementary German Laboratory 0 (1) Non-credit laboratory to accompany GER 1020. *Coreq:* GER 1020.

GER 1040 Basic German 4 (3) Intensive one-semester program combining GER 1010 and 1020 for students who have previously studied German. Includes fundamentals of grammar and vocabulary as a foundation for written and oral proficiency. *Coreq:* GER 1041.

GER 1041 Basic German Laboratory 0 (1) Non-credit laboratory to accompany GER 1040. *Coreq:* GER 1040.

GER 1510 German for Graduate Students 3 (3) Intensive program only for graduate students preparing for the reading examination in German. A minimum grade of B on a final examination will satisfy graduate school foreign language requirement. May be repeated once for credit. To be taken Pass/No Pass only. *Preq:* Graduate standing.

GER 2010 Intermediate German 3 (3) Brief review of GER 1010 and 1020, with conversation, composition, and dictation, and the reading of more serious German prose in short stories and plays. Includes literary and cultural perspectives. Includes Honors sections. *Preq:* GER 1020. *Coreq:* GER 2011.

GER 2011 Intermediate German Laboratory 0 (1) Non-credit laboratory to accompany GER 2010. *Coreq:* GER 2010.

GER 2020 Intermediate German 3 (3) Emphasizes reading nontechnical German prose more rapidly. Writing, speaking, and listening skills continue to be developed. Includes literary and cultural perspectives. Includes Honors sections. *Preq:* GER 2010. *Coreq:* GER 2021.

GER 2021 Intermediate German Laboratory 0 (1) Non-credit laboratory to accompany GER 2020. *Coreq:* GER 2020.

GER 2600 Selected Topics in German Literature 3 (3) Study of significant aspects of German literature. Conducted in English.

GER 2970 Creative Inquiry—German 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration. *Preq:* Consent of faculty member.

GER 2990 Foreign Language Drama Laboratory 1 (3) Participation in foreign language drama productions. No formal class meetings, but an average of three hours per week in a foreign language drama workshop for production. May be repeated for a maximum of three credits. *Preq:* Consent of instructor directing the play.

GER 3050 German Conversation and Composition 3 (3) Training in spoken and written German emphasizing vocabulary acquisition, oral and written communication strategies, appropriate linguistic formulations for specific cultural contexts, and stylistics. *Preq:* GER 2020.

GER 3060 The German Short Story 3 (3) Examines the Austrian, German, and Swiss short story as a distinct literary genre that flourished particularly after 1945. Provides ample conversation and composition practice, as well as an introduction to principles of literary prose analysis. *Preq:* GER 2020.

GER 3100 Summer Immersion Program 6 (6) Conducted entirely in German for eight hours daily. Program consists of activities that combine interrelating cultural topics with language skill practice. Frequent opportunities to converse with native speakers during meals and on excursions. Students receive six credits, three of which may be taken in lieu of GER 2020. *Preq:* GER 2010.

GER 3160 German for International Trade I 3 (3) Spoken and written German common to the German-speaking world of business and industry emphasizing business practices and writing and translating business letters and professional reports. Cross-cultural references provide opportunity for comparative and contrastive analysis of American and German cultural patterns in a business setting. *Preq:* GER 2020. *Preq or concurrent enrollment:* GER 3050.

GER 3400 German Culture 3 (3) Examines the cultures of German-speaking nations from their origins to the present. Emphasizes the Federal Republic of Germany both before and after the German unification of 1990. *Preq:* GER 2020.

GER 3600 German Literature to 1832 3 (3) Examines selected topics in German literature from the Middle Ages to 1832. Readings may include works by Lessing, Goethe, Schiller, and the Romantics. *Preq or concurrent enrollment:* GER 3050 or GER 3060.

GER 3610 German Literature from 1832 to Modernism 3 (3) Examines drama, poetry, and prose from the Biedermeier period through naturalism and realism to the advent of modernism. *Preq:* GER 3050 or GER 3060.

GER 3690 Special Topics in German Literature 3 (3) Study of a significant aspect of German literature. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* GER 3050 or GER 3060.

GER 3970 Creative Inquiry—German 1-4 (1-4) Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.

GER 3980 Directed Reading 1-3 (1-3) Directed study of selected topics in German literature, language, and culture. May be repeated for a maximum of six credits. *Preq:* Consent of department chair.

GER 4050 Advanced Contemporary German Language 3 (3) Advanced study of spoken and written contemporary German based on modern autobiographical texts, eyewitness accounts of recent historical events, and media coverage of current events. Employs Internet, print and audio texts, TV programs, and photo series. *Preq:* One 3000-level German course.

GER 4160 German for International Trade II 3 (3) Study of language and cultural environment of the German-speaking markets of the world, including linguistic and cultural idioms that support global marketing in general and the international marketing of textiles, agricultural products, and tourism in particular. *Preq:* GER 3160.

GER 4170 Topics in German for International Trade 3 (3) Examination and analysis of selected topics related to the business culture and economy of Germany, Austria, Switzerland, the European Union, or the European Free Trade Association. Topics may include the reconstruction of Eastern Germany's economy, the expansion of the European Union, or current events of economic importance. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* One 3000-level German course.

GER 4500 Advanced Studies in German Drama 3 (3) Extensive study of a major theme or aspect of German drama. May include recorded live performances, stage design, theatre architecture, and the music and art of the theatre. *Preq:* GER 3050 or GER 3060.

GER 4550 German Film 3 (2) Overview of German cinema including the expressionist classics of the Weimar Republic, entertainment and documentary movies of the Nazi era, classics of the postwar New German Wave (West Germany), distinctive East German films, and vanguard contemporary films. *Preq:* GER 3050 or GER 3060. *Coreq:* GER 4551.

GER 4551 German Film Laboratory 0 (3) Non-credit laboratory to accompany GER 4550. *Coreq:* GER 4550.

GER 4600 Modernism in German Literature 3 (3) Study of major works of German literature and culture in the modernist era (1888-1933). May include drama, music, philosophy, and the plastic arts. *Preq:* GER 3050 or GER 3060.

GER 4610 German Literature Since 1933 3 (3) Study of selected authors, texts, or genres in contemporary German literature. *Preq:* GER 3050 or GER 3060.

GER 4750 Advanced German Seminar 3 (3) Concentrated research and discussion on advanced topics, works, or texts in German literature, film, art, drama, music, or philosophy. Conducted in German. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* One 4000-level German course.

GER 4760 Advanced Seminar in German Thought 3 (3) Concentrated research and discussion on advanced topics, works or texts in German literature, film, art, drama, music or philosophy. Conducted in English. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Senior standing.

GER 4970 Creative Inquiry—German 1-4 (1-4) Continuation of research initiated in GER 3970. Students complete their project and disseminate their research results. *Preq:* GER 3970.

GER 4980* Independent Study 1-3 (1-3) Supervised study of selected topics in German literature, language, or culture. May be repeated for a maximum of six credits. *Preq:* Consent of department chair.

GREAT WORKS

GW (ENGL) 3010 Great Books of the Western World 3 (3) Introduces Great Works minor. Includes readings about the Great Books concept, as well as various great books from the humanities, arts and natural and social sciences. Includes Honors sections. May also be offered as ENGL 3010. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

GW 4020 Great Works of Science 3 (3) Understanding of science in terms of its history and its approach to problem-solving through study of selected great works. Emphasis is on developing students' abilities to reflect on the problems and methodologies encountered in the scientific method. Includes Honors sections.

GW 4030 Special Topics in Continental Literature 3 (3) Important primary texts written in modern European languages are taught in English. Content varies according to instructor. Includes Honors sections. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

GW 4050 The Darwinian Revolution 3 (3) Examination of Charles Darwin's *The Origin of Species* and its cultural impact from his time to ours. Topics include the contemporaneous reception of Darwin's work, the Scopes Monkey Trial, and more recent controversies over Creationism and Intelligent Design. Includes Honors sections. *Preq:* ENGL 2020 or ENGL 2120 or ENGL 2130 or ENGL 2140 or ENGL 2150.

HEALTH CARE GENETICS

HCG (NURS) 3330 Health Care Genetics 3 (3) Focuses on the new genetics and the implications for health care professionals. Discussion includes applications of the evolving genetics technology and services to changing life stages. Issues of ethics relevant to various genetic disorders is also addressed. May also be offered as NURS 3330. *Preq:* BIOL 2220.

HEALTH, EDUCATION AND HUMAN DEVELOPMENT

HEHD 1990 Creative Inquiry I 1-3 (1-3) In consultation with and under the direction of a faculty member, students pursue a first phase of scholarly activities in teams. These creative inquiry projects may be discipline-specific or interdisciplinary in nature. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. *Preq:* Consent of instructor.

HEHD 2990 Creative Inquiry II 1-3 (1-3) In consultation with and under the direction of a faculty member, students pursue a second phase of scholarly activities in teams. These creative inquiry projects may be discipline-specific or interdisciplinary in nature. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. *Preq:* Sophomore standing, consent of instructor.

HEHD 3990 Creative Inquiry III 1-3 (1-3) In consultation with and under the direction of a faculty member, students pursue a third phase of scholarly activities in teams. These creative inquiry projects may be discipline-specific or interdisciplinary in nature. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. *Preq:* Junior standing, consent of instructor.

HEHD 4000* Introduction to Leadership Theories and Concepts 3 (2) Interdisciplinary course introduces students to the nature of leadership. Students gain a broad understanding of the history and origins of leadership, theoretical approaches to leadership, and the essence of contemporary leadership. Students are encouraged to test their ability to apply these concepts to life experiences. *Preq:* Junior standing. *Coreq:* HEHD 4001.

HEHD 4001* Introduction to Leadership Theories and Concepts Laboratory 0 (1) Non-credit laboratory to accompany HEHD 4000. *Coreq:* HEHD 4000.

HEHD 4100* Leadership Behavior and Civic Engagement 3 (2) Students couple concepts of social justice and civic engagement with theoretical foundations from HEHD 4000 to complete a comprehensive theory to practice project. Students are introduced to a comprehensive leadership skill set to become active change agents for the common good. *Preq:* HEHD 4000. *Coreq:* HEHD 4101.

HEHD 4101* Leadership Behavior and Civic Engagement Laboratory 0 (1) Non-credit laboratory to accompany HEHD 4100. *Coreq:* HEHD 4100.

HEHD 4200* Leadership Application and Experience 3 (2) Students are immersed in a practical leadership experience utilizing knowledge and skills gained in HEHD 4000 and 4100. Students identify an issue or problem and practice leadership by developing and implementing a community project. Students are challenged to commit themselves to long-term engagement as agents of change. *Preq:* HEHD 4100. *Coreq:* HEHD 4201.

HEHD 4201* Leadership Application and Experience Laboratory 0 (3) Non-credit laboratory to accompany HEHD 4200. *Coreq:* HEHD 4200.

HEHD 4990 Creative Inquiry IV 1-3 (1-3) In consultation with and under the direction of a faculty member, students pursue a fourth phase of scholarly activities in teams. These creative inquiry projects may be discipline-specific or interdisciplinary in nature. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. *Preq:* Senior standing and consent of instructor.

HISTORY

Professors: J.R. Andrew Jr., S.L. Barczewski, J.M. Burns, *Chair;* E.D. Carney, H.R. Grant, T.J. Kuehn, S.G. Marks, E.E. Moise, Jr, M.N. Taylor-Shockley; *Associate Professors:* A.A. Bartley, A. Bein, P.C. Anderson, C. Dunn, C.A. Grubb, P.E. Mack, R.A. Moore, M.S. Silvestri; *Assistant Professors:* M.L. Meng, M. Morey, L. B. Wilson; *Lecturers:* J.B. Jeffries, E.K. Wood

HIST 1000 Higher Education and Clemson 2 (2) Introduction to higher education and its background and development in the United States, emphasizing land-grant institutions and Clemson University in particular.

HIST 1010 History of the United States 3 (3) Political, economic, and social development of the American people from the period of discovery to the end of Reconstruction. Includes Honors sections.

HIST 1020 History of the United States 3 (3) Political, economic, and social development of the American people from the end of Reconstruction to the present. Includes Honors sections.

HIST 1220 History, Technology, and Society 3 (3) Topics in the history of technology with emphasis on how technology affects society and how society shapes technology. Emphasis is on 19th and 20th century America, but some material from other periods of Western Civilization and other world regions may be discussed. Includes Honors sections.

- HIST 1240 Environmental History Survey 3 (3)** Introduction to environmental history, in the United States and globally, with emphasis on changing attitudes toward the environment and the interaction between science and public policy. Includes Honors sections.
- HIST 1720 The West and the World I 3 (3)** Examines the history of the West from early times until 1648. After a comparative evaluation of the emergence of civilization around the globe, course concentrates on the history of the peoples of Europe up to the age of European exploration and overseas expansion. Includes Honors sections.
- HIST 1730 The West and the World II 3 (3)** Surveys the history of the West in modern times, from the late 17th century to the present. Particular emphasis is placed on Europe's interaction with non-western societies. Through cross-cultural comparisons, European history is placed in global context. Includes Honors sections.
- HIST 1930 Modern World History 3 (3)** Political, economic, social, and cultural history of the modern world from the 19th century to the present.
- HIST 1980 Current History 1 (1)** Examination of major events and problem areas in the news emphasizing their historical context and possible long-range significance. May be repeated for a maximum of three credits. Does not count toward the requirements of the major or minor in History.
- HIST 2000 Fort Hill Internship 1-3 (1-3)** Provides practical experience in public history museum work and/or historical preservation in the setting of Fort Hill. May be repeated for a maximum of three credits. To be taken Pass/No Pass only. *Preq:* Consent of internship director.
- HIST 2010 Prelaw Internship 1-3 (1-3)** Faculty-supervised internship in a law firm or other legal setting. Introduces students to the workings of the legal system. To be taken Pass/No Pass only. *Preq:* History major and sophomore standing.
- HIST 2020 Internship 1-3 (1-3)** Exposes History majors to hands-on experience in research, analysis, and public presentation of historical scholarship. May include working with faculty on research projects, in museums or historical organizations, or at sites. May be repeated for a maximum of three credits. To be taken Pass/No Pass only. *Preq:* Sophomore standing.
- HIST 2890 Creative Inquiry—History 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of nine credits. *Preq:* Consent of faculty member/mentor.
- HIST 2990 Seminar: The Historians Craft 4 (3)** Writing and speaking intensive course to introduce History majors to study of what history is and what a historian does, including historiography, research techniques, ethics of the historical profession, and forms of presentation. *Preq:* History major. *Coreq:* HIST 2991.
- HIST 2991 Seminar: The Historians Craft Laboratory 0 (2)** Non-credit laboratory to accompany HIST 2990. *Coreq:* HIST 2990.
- HIST 3000 History of Colonial America 3 (3)** Development of American institutions and customs in the period before 1776. Considerable emphasis is placed on the imperial relations between Great Britain and her colonies and upon the movement towards and the philosophy of the American Revolution.
- HIST 3010 American Revolution and the New Nation 3 (3)** Study of the various historical explanations leading to an understanding of the American Revolution, the establishment of the nation under the Constitution, and the first decade of the new nation. Special emphasis is on developing an understanding of individual motivation and ideological development present during the last four decades of the 18th century.
- HIST 3020 Age of Jefferson, Jackson, and Calhoun 3 (3)** Formation and growing pains of the new nation through the Federal and Middle periods of its history emphasizing economic and political development, the westward movement, and the conflicting forces of nationalism and sectionalism.
- HIST 3030 Civil War and Reconstruction 3 (3)** Study of the political, military, and social aspects of the sectional conflict and of the era of Reconstruction. Some emphasis is placed on the historical controversies inspired by the period.
- HIST 3040 Industrialism and the Progressive Era 3 (3)** Study of American society in the period between the 1880's and 1930's. Emphasizes the effects of industrialization and urbanization on the American people.
- HIST 3050 The United States in the Jazz Age, Depression, and War: 1918-1945 3 (3)** Starting at Armistice Day, 1918, course analyzes the dawn of the age of mass consumption and mass communication, the Crash of 1929, Franklin Roosevelt and the New Deal, the gathering war clouds in Europe and Asia, and the Great Crusade of World War II. *Preq:* Sophomore standing.
- HIST 3060 The United States in the Postwar World: 1945-1975 3 (3)** Examination of the American experience from the end of World War II through the period of the Korean and Vietnam wars, the Cold War, the Civil Rights movement, the counter-culture of the 1960's, assassinations, and Watergate.
- HIST 3080 The United States in the Age of Reagan and Clinton: 1975-Present 3 (3)** The United States and the world in the recent era of economic and political upheaval, the end of the Cold War, the rise of the global economy and terrorism, social and cultural change, and deepening political and social divisions. *Preq:* Sophomore standing.
- HIST (REL) 3100 History of Religion in the United States 3 (3)** Development of religion in the U.S. from the Colonial period to the 20th century. Attention is devoted to analyzing the broad currents in religious movements and religious thought that have given shape to the American pluralistic experience. May also be offered as REL 3100.
- HIST 3110 African American History to 1877 3 (3)** Study of the African-American experience in the United States from the African past through slavery to 1877.
- HIST 3120 African American History from 1877 to the Present 3 (3)** Study of African American experience in the United States from 1877 to the present.
- HIST 3130 History of South Carolina 3 (3)** Political, economic, and social development of South Carolina from 1670 to the present. Includes Honors sections.
- HIST 3140 History of the South to 1865 3 (3)** Origins and development of political, social, economic, and cultural institutions of the South from the Colonial period to the end of the Civil War and the role of the South in the nation's development.
- HIST 3160 American Social History 3 (3)** Study of American society, including the relationship among classes, ethnic groups, regions, and sexes, from the Colonial period to the present.
- HIST 3180 History of American Women 3 (3)** Survey course of the history of American women emphasizing the changing role of women in American culture and society.
- HIST 3190 Gender and Law in United States History 3 (3)** Survey of how law has reflected and created distinctions on the basis of gender and sexuality throughout United States history. Emphasizes the relationship between legal rules and social conditions and the way in which groups have challenged these legal categories over time.
- HIST (EDF) 3200 History of United States Public Education 3 (3)** Historical survey of the development of United States public schools. May also be offered as EDF 3200. *Preq:* Junior standing.
- HIST 3210 History of Science 3 (3)** Survey of the development of science in the Western world, emphasizing the period from the Renaissance to the present.
- HIST 3220 History of Technology 3 (3)** History of the major developments in Western technology and their relationships to the societies and cultures in which they flourished.
- HIST 3230 History of American Technology 3 (3)** History of developments in technology and their role in American life with particular emphasis on the American Industrial Revolution and the 20th century.
- HIST 3240 History of the South, 1865 to the Present 3 (3)** Development of political, social, and cultural institutions of the South from the end of the Civil War to the present and the South's relationship to the rest of the nation.
- HIST 3250 American Economic Development 3 (3)** Economic development of the United States from Colonial to recent times, emphasizing the institutional development of agriculture, banking, business and labor, and government regulations and policy.
- HIST 3260 History of American Transportation 3 (3)** Examines the principal forms of transportation in the United States from colonial times to the present, including water, road, canal, railroad, internal combustion, and air. Emphasizes technological developments and economic, geographic, and social impact of specific transport forms.
- HIST 3270 American Business History 3 (3)** Survey of the history of American business using a case-study approach. Focuses on the effects that policies and institutions have on individual businesses.

- HIST 3280 United States Legal History to 1890** 3 (3) Survey of the American legal system in its historical perspective from Colonial times to 1890. Emphasizes the relationship between law and society, the way in which the practice of law changed American society, and the way in which social development affected both the theory and practice of the law.
- HIST 3290 United States Legal History Since 1890** 3 (3) Examination of the social, cultural, intellectual, economic, and political forces that have helped shape the law in the U.S. since 1890.
- HIST 3300 History of Modern China** 3 (3) Growth and development of Chinese civilization from ancient times to the present. Emphasis is on 20th century China, particularly since the rise to power of the Communist regime.
- HIST 3330 History of Modern Japan** 3 (3) Origin and development of Japanese civilization with particular emphasis on modern Japan from mid-19th century to the present.
- HIST 3340 Premodern East Asia** 3 (3) Introduction to histories of China and Japan, from antiquity to approximately 1850. Political, religious, artistic, and other aspects of premodern society are examined and compared in order to gain significant insights regarding the premodern antecedents of these two dynamic and important nations.
- HIST 3370 History of South Africa** 3 (3) Examines the important trends in the history of South Africa from earliest times to the present. Topics include nature of precolonial society, European immigration, rise of industrial capitalism, advent of Apartheid, and the liberation struggle.
- HIST 3380 African History to 1875** 3 (3) Study of sub-Saharan Africa from antiquity to European colonial rule, exploring the development of Stone Age cultures; agricultural and pastoral societies; ancient civilizations; political, economic, and social systems; gradual shift of initiative from the interior to the coast; and various slave trades.
- HIST 3390 Modern Africa, 1875 to the Present** 3 (3) Study of sub-Saharan Africa from 1875 to the present, with focus on the development and decline of European imperialism, dilemmas of African independence, and ethnic struggles in Southern Africa.
- HIST 3400 Latin America: From Conquest to Independence** 3 (3) Examination of the encounters, collaborations, and clashes that characterized the conquest period and beyond in Latin America. Readings are assigned regarding the spiritual, biological, social, and political consequences of the meeting of Indians, Africans, and Europeans. Historical sources include images, artwork, letters, and memoirs.
- HIST 3410 Modern Mexico** 3 (3) Introduction to the geography of the region; origins and progress of the Independence movements; political, economic, and social developments after 1825; and current domestic and international problems.
- HIST 3420 South America Since 1800** 3 (3) Introduction to the geography of the region; origins and progress of the Independence movements; political, economic, and social developments after 1825; and current domestic and international problems.
- HIST (REL) 3510 Ancient Near East** 3 (3) History of the peoples and civilizations of the Near East from the Sumerians to the establishment of Roman power in this region. Includes geography, mythology, religious, and economic currents as well as the methods and discoveries of archaeology. May also be offered as REL 3510.
- HIST 3520 Egypt in the Days of the Pharaohs** 3 (3) Egyptian civilization from its beginning until the period of Roman conquest. Includes a survey of political history but also deals with daily life, making much use of archaeological evidence.
- HIST 3530 Women in Antiquity** 3 (3) Focuses on women in the ancient period in Mesopotamia, Israel, Egypt, Greece, Rome, and in the early Christian Church. Formation of gender roles and issues related to ancient sexuality also receive attention.
- HIST 3540 The Greek World** 3 (3) Study of Greek civilization from its beginning until the time of the Roman conquest, concentrating on the social institutions of the Greek city-states.
- HIST 3550 The Roman World** 3 (3) Considers the rise of Rome to world empire and the international civilization it dominated. Concentrates on the nature of the political change from Republic to monarchy with particular emphasis on city life and the causes of its decline.
- HIST 3610 History of Britain to 1688** 3 (3) Study of historical developments in the British Isles through the 17th century. Focus is on political institutions, warfare, social and economic trends, and cultural and legal developments.
- HIST 3630 Britain Since 1688** 3 (3) Study of political, cultural, social, economic, and imperial issues in the history of the British Isles from the late 17th century to the present. Includes Honors sections.
- HIST 3650 British Cultural History** 3 (3) Examination of topics in British cultural history from the 17th century to the present. Emphasizes the 19th and 20th centuries.
- HIST 3670 Modern Irish History** 3 (3) Examines Irish history over the past four centuries, with particular attention to the 19th and 20th centuries. Irish political, social, economic, and cultural history, Anglo-Irish relations, and the Irish diaspora are considered.
- HIST 3700 Medieval History** 3 (3) Survey of the period from the eclipse of Rome to the advent of the Renaissance, emphasizing human migrations, feudalism, rise of towns, and cultural life.
- HIST 3720 The Renaissance** 3 (3) Examination of the transitional period of European civilization (ca. 1300–1500) emphasizing institutional, cultural, and intellectual developments.
- HIST (REL) 3730 Age of the Protestant Reformation** 3 (3) Evolution of Modern Europe (ca. 1500–1660), as affected by the Reformation, wars of religion, and growth of nation-states. Study includes intellectual advances and the beginnings of European expansion overseas. May also be offered as REL 3730.
- HIST 3740 Europe in the Age of Reason** 3 (3) Study of the quest for order and the consolidation of the European state system between 1660 and 1789 with emphasis on the idea of absolutism, the question of French hegemony, and the synthesis of the 18th-century Enlightenment.
- HIST 3750 Revolutionary Europe** 3 (3) History of Europe from the outbreak of the French Revolution through the Revolutions of 1848 emphasizing the conflict between the forces of change and those of conservatism, within the states and in Europe in general.
- HIST 3770 Europe, 1914–1945** 3 (3) Focuses on Europe during two major wars and the peacetime adjustments Europeans made, or failed to make, during the twenty-year interim between those wars.
- HIST 3780 Europe Since 1945** 3 (3) Focuses on how World War II completed the destruction of European global hegemony, creating a bipolar continent with the west dominated by the United States and the east by Soviet Russia, and how Europe adjusted to this situation.
- HIST 3800 Imperial Germany** 3 (3) German history from the beginning of the German Empire, 1870–71, through World War I. Emphasizes the influence of militarism, nationalism, anti-Semitism, and xenophobia on the German culture and political process.
- HIST 3810 Germany Since 1918** 3 (3) German history from the time of Germany's defeat in World War I, through the Nazi period and World War II. Culminates with the study of a divided Germany.
- HIST 3840 History of Modern France** 3 (3) French history from mid-19th century to the present with particular emphasis on France since 1900.
- HIST 3850 History of Imperial Russia** 3 (3) Survey of the formative years of the Russian Empire from the time of accession of Peter the Great to the time of the Russian Revolution. Social, political, diplomatic, and intellectual developments are given equal treatment.
- HIST 3860 History of the Soviet Union** 3 (3) Soviet history from the revolution to 1991. Surveys the creation and subsequent development of the communist political and social system, with attention given to culture and diplomacy.
- HIST 3870 The Russian Revolution** 3 (3) History of one of the most formative series of events of the 20th century. Follows the crisis of Imperial Russia, its downfall during World War I, and subsequent revolutionary upheaval leading to the formation of the USSR.
- HIST 3890 Creative Inquiry—History 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of nine credits. *Prq:* Consent of faculty member/mentor.
- HIST 3900 Modern Military History** 3 (3) Survey of the development of modern warfare and the influence of technological change on warfare. Particular attention is given to the major conflicts of the 20th and 21st centuries.
- HIST 3910 Post World War II World** 3 (3) Examines the world in the age of the Cold War; the breakdown of the colonial empires; and racial, religious, ethnic, national, and social tensions. The United States provides the central core to the class.

- HIST 3920 History of the Environment of the United States 3 (3)** Examination of the historical development of the attitudes, institutions, laws, people, and consequences that have affected the environment of the United States from pre-Columbian days until the present. Emphasizes the interaction of human beings within and with the environment.
- HIST 3930 Sports in the Modern World 3 (3)** Analysis of the global evolution and diffusion of sports in the industrial age emphasizing the linkage of sports structure and performance to the larger social context.
- HIST 3940 Non-Western History 3 (3)** Examines the important trends in world history since 1500—including capitalism, industrialization, nationalism, migration, and imperialism—with a focus on non-Western regions. *Prq:* HIST 1730.
- HIST 3950 Civil Rights History 3 (3)** Examines the development of American civil rights from the creation of the Constitution through the present. Emphasis is on the legal struggle of African Americans for civil rights, but how other groups fought for rights in the courts is also considered.
- HIST 3960 The Middle East to 1800 3 (3)** Examines the histories, cultures, and societies of the Middle East from the rise of Islam in the seventh century to the eve of European colonial penetration.
- HIST 3970 Modern Middle East 3 (3)** Examines the histories, cultures, and societies of the Middle East from the 18th century to the present day with particular emphasis on contemporary issues.
- HIST 4000* Studies in United States History 3 (3)** Topics and problems in the history of the United States from the Colonial era to the present. May be repeated once for credit with departmental consent.
- HIST 4090 Kennedy Assassination and Watergate 3 (3)** Journey into the underbelly that examines the diverse elements of national security, divisive politics, the Cold War and Cuba, FBI, CIA, the mob, fanaticism, anomie, and threats to the stability of the republic that seem to have come together in Dallas in 1963 and in Watergate. *Prq:* Junior standing.
- HIST 4140 Introduction to the Study of History Museums 3 (3)** An Introduction to the field of museology, covering the history, philosophy, and ethics of the profession; various types of museums, and different aspects of museum work; the museum's role in the community; and the effects of philanthropy and government on museums. *Prq:* Any 3000-level history course.
- HIST 4150* Introduction to Digital Methods for History 3 (3)** Introduces students to the philosophy and practice of digital methods for historical research and communication. Includes the use of new media by public historians to enhance their archival/museum/center's visibility with the general public. *Prq:* Any 3000-level history course.
- HIST 4170* History and Tourism 3 (3)** Introduces students to important scholarship in the heritage tourism field. Examines the origins and objectives of heritage tourism, and case studies of how professionals employ heritage tourism. *Prq:* Any 3000-level history course.
- HIST 4180* Oral History and Local History 3 (3)** Introduces students to the most recent work in oral history and methodology with a focus on the history of the Upstate and Appalachia from the colonial era to the present. Students engage in their own local oral history project and produce a research paper based on their findings. *Prq:* Any 3000-level history course.
- HIST 4200* History and Film 3 (2)** Analyzes the role of the cinema in the construction and dissemination of history. May be repeated once for credit with departmental consent. *Coreq:* HIST 4201.
- HIST 4201* History and Film Laboratory 0 (3)** Non-credit laboratory to accompany HIST 4200. *Coreq:* HIST 4200.
- HIST 4240 Topics in History of Medicine and Health 3 (3)** Selected topics in the development of medicine and health care including public attitudes towards health and medicine.
- HIST 4360* The Vietnam Wars 3 (3)** Wars in Vietnam are seen in two phases. The First Indochina War, 1946-54, is covered briefly. Main body of the course covers the Second Indochina War, which began as a guerrilla conflict in 1959-60 and ended as a mostly conventional war in the Communist victory of 1975.
- HIST 4380* Problems in African Historiography and Methodology 3 (3)** Concentrates on major issues in the field of African history with an additional focus on methodological concerns. May be repeated once for credit with departmental consent.
- HIST 4400* Studies in Latin American History 3 (3)** Consideration of selected and varied topics in Latin American history through readings, discussions, and individual or group projects. Special attention is given to the use of an inquiry or problem-solving method of historical analysis and to the cultivation of a comparative perspective. May be repeated once for credit with departmental consent.
- HIST 4500* Studies in Ancient History 3 (3)** Selected topics in ancient history ranging from pre-Biblical times to the fall of the Roman Empire. May be repeated once for credit with departmental consent.
- HIST 4510* Alexander the Great 3 (3)** Focuses on the career of Alexander the Great and deals with the history and archaeology of ancient Macedonia.
- HIST (REL) 4520* History of Early Christianity 3 (3)** Study of the history, social and doctrinal, of early Christianity up to 600 A.D. May also be offered as REL 4520.
- HIST 4600* Studies in British History 3 (3)** Examination of selected themes, topics, or periods in British history from Anglo-Saxon times to the present. May be repeated once for credit with departmental consent. Includes Honors sections.
- HIST 4700* Studies in Early European History 3 (3)** Study of selected topics or themes in European history from the fall of the Roman Empire to the age of industrialization. May be repeated once for credit with departmental consent.
- HIST 4710* Studies in Modern European History 3 (3)** Study of selected topics or problems in European history from the end of the Old Regime to the present. May be repeated once for credit with departmental consent. Includes Honors sections.
- HIST 4720* Medieval Conquests and Crusades 3 (3)** Focuses on medieval conquests with particular emphasis on the era of the crusades. Investigates the origins and historical significance of the crusades from both Christian and Muslim perspectives, and examines crusader societies at home and abroad. Explores other medieval colonization movements and religious justifications for warfare outside the Holy Land.
- HIST 4800 Museum Practicum 3 (3)** Introduces critical issues and museum theoretical perspectives affecting museum curators and other museum professionals. Students integrate theory with practical experience in public history realm as they work with museum professionals. *Prq:* HIST 4140.
- HIST 4870* World War II and the World 3 (3)** World War II was a cataclysm of the twentieth century that touched every part of the globe and ushered in the atomic age. This course examines the war from its origins in the aftermath of World War I to the war crimes trials and the dawn of the Cold War.
- HIST 4880 Studies in Middle East History 3(3)** Examination of selected themes and topics in the history of the Middle East. May be repeated for a maximum of six credits with departmental consent.
- HIST 4900 Senior Seminar 3 (3)** Seminar in current research themes in history. Students conduct directed research on a particular topic and learn research, writing, and oral presentation techniques. Seminar topics vary from section to section and from semester to semester. *Prq:* History major and Senior standing and HIST 2990 with a C or better.
- HIST 4910* Studies in the History of Science and Technology 3 (3)** Selected topics in the development of science and technology emphasizing their social, political, and economic effects. May be repeated once for credit with departmental consent. Includes Honors sections.
- HIST 4920* Studies in Diplomatic History 3 (3)** Selected topics and problems in international conflict and conflict resolution among nations. Concentration is usually in 20th century history. May be repeated once for credit with departmental consent.
- HIST 4930* Studies in Social History 3 (3)** Studies in the ways people have earned their livings and lived their lives, individually and as communities, in the confines of different societies. May be repeated once for credit with departmental consent.
- HIST 4940* Studies in Comparative History 3 (3)** Selected topics in comparative history, contrasting and comparing similar historic developments in different nations, geographic areas, or civilizations. May be repeated once for credit with departmental consent.
- HIST 4950* Studies in the History of Ideas 3 (3)** Selected topics and themes in the development of ideas that have had an impact on the behavior of individuals and civilizations. May be repeated once for credit with departmental consent.
- HIST 4960* Studies in Legal History 3 (3)** Study of selected problems in the development of law and the system of criminal and civil justice. May be repeated once for credit with departmental consent.

HIST 4970 Senior Honors Research 3 (3) Research for the preparation of senior honors thesis. *Preq:* Senior standing, completion of a 4000-level history course, approval of the History Department. May be repeated once for credit with departmental consent.

HIST 4980 Senior Honors Thesis 3 (3) Writing of the senior honors thesis. May be repeated once for credit with departmental consent. *Preq:* HIST 4970.

HIST 4990 Independent Study 1-3 (1-3) Study of selected problems in history under the direction of a faculty member chosen by the student. Student and faculty member develop a course of study designed for the individual student and approved by the department chair prior to registration. May be repeated once for credit with departmental consent. *Preq:* Consent of department chair.

HEALTH

Professors: L.A. Crandall, C.J. Dye, D.B. Jackson, J.B. Kingree, R.M. Mayo, W.W. Sherrill, H.D. Spitler; *Research Professor:* M.P. Thompson; *Associate Professors:* R.W. Gimbel, *Chair;* S.F. Griffin, K.A. Kemper, J.E. Williams; *Assistant Professors:* L. Shi, K.D. Truong; *Senior Lecturers:* D.A. Falta, K.M. Meyer, *Lecturer:* R.S. Welsh; *Adjunct Faculty:* G.L. Adams, B.F. Campbell, V.S. Gallicchio, M.J. Hudson, W.J. Jones, J.T. Kirby, B.A. Lessey, W.C. Logan, J.A. McCubbin, M.C. Riordan, S. Verderber, J.G. Wong; *Adjunct Lecturers:* D.M. Charles, E.J. Walker

HLTH 2020 Introduction to Public Health 3 (3) Examination of the forces that have influenced current health delivery systems, health practices, and trends. General systems theory is introduced. Health majors are given enrollment priority.

HLTH 2030 Overview of Health Care Systems 3 (3) Introduction to the health care delivery system including public health and health care components. Examines and discusses individual and public expectations of need and demand for health care and delivery of public health and health care services.

HLTH 2400 Determinants of Health Behavior 3 (3) Analysis of health behaviors based on psychological, social, cultural, and environmental factors. Introduces health behavior theories. *Preq:* HLTH 2020 or HLTH 2980 and Health Science major.

HLTH 2500 Health and Fitness 3 (3) Study of interrelationship between health and fitness. Emphasizes the cardiovascular system and benefits of exercise.

HLTH 2980 Human Health and Disease 3 (3) Study of good health practices emphasizing lifestyles and measures of health. Health majors are given enrollment priority.

HLTH 3010 Fieldwork in Health Careers 3 (3) Using experiential and online learning methods, this course provides opportunities for students to building understanding of the healthcare system, learn about health care careers and enhance leadership skills.

HLTH 3030 Public Health Communication 3 (3) Introduction to the use of health and communication theory and social marketing strategies to create effective, evidence-based, culturally appropriate health communication messages and campaigns. *Preq:* HLTH 2400 and HLTH 2980.

HLTH 3050 Body Response to Health Behaviors 3 (3) Positive benefits and the negative impact of certain behaviors at cellular, organ, and body-system levels are examined. The pathways of selected injury and disease are explored. Expected physiological changes are applied in identifying strategies for promoting health in the presence (or absence) of disease. Health majors are given enrollment priority. *Preq or concurrent enrollment:* BIOL 2230.

HLTH 3100 Women's Health Issues 3 (3) Exploration of specific health needs of women, with emphasis on understanding and preventing problems of women's health. Health majors are given enrollment priority. *Preq:* Junior standing.

HLTH 3150 Social Epidemiology 3 (3) Exploration of the current problems and issues associated with the health of population groups. The interrelationships of biological, sociocultural, behavioral, environmental, political, and economic risk factors and the health and illness patterns of those in population groups are examined. *Preq:* HLTH 2980 and HLTH 3800.

HLTH 3200 Health Maintenance for Men 3 (3) Exploration of specific health maintenance needs of men, with emphasis on understanding and preventing problems of men's health. Health majors are given enrollment priority. *Preq:* Sophomore standing.

HLTH 3400 Health Promotion Program Planning 3 (3) Students develop skills to conduct community health needs assessments and to plan and evaluate theoretically grounded health promotion intervention programs for diverse populations. Best practices for specific health behavior change interventions are identified. *Preq:* HLTH 2400 and HLTH 2980.

HLTH 3500 Medical Terminology and Communication 3 (3) Skills in building, analyzing, defining, pronouncing, and spelling medical terms related to the human body are developed and applied through electronic communication. *Preq:* Junior standing.

HLTH (AGRB) 3610 Introduction to Health Care Economics 3 (3) Introductory course in which students learn the basic economics of the institutions comprising the health-care industry. Topics include the underlying supply, demand, and institutional factors impacting health-care availability and cost of health care. May also be offered as AGRB 3610.

HLTH 3800 Epidemiology 3 (3) Introduces epidemiological principles and methods used in the study of the origin, distribution, and control of disease. Health majors are given enrollment priority. *Preq:* STAT 2300 and at least one 2000-level HLTH course.

HLTH 3950 Honors Research Seminar 3 (3) Students review basic steps in the development of an honors research proposal and develop a draft of the proposal under the supervision of a faculty mentor. Students are also required to attend research presentations of senior departmental honors students. *Preq:* HLTH 3800 and Junior standing.

HLTH 3980 Health Appraisal Skills 1 (3) Utilizes laboratory experiences to measure health risk, interpret laboratory health data, and design personal health programs. Restricted to Health Science majors. *Preq:* HLTH 2980.

HLTH 4000* Selected Topics in Health 1-6 (3-18) Topics in health selected to meet special and individualized interests of students. May be repeated for a maximum of nine credits, but only if different topics are covered. *Preq:* Junior standing and consent of instructor.

HLTH 4010 Health Consumerism 3 (3) Exploration of consumer decisions regarding health products and services emphasizing strategies for decision making. Health majors are given enrollment priority. *Preq:* Junior standing.

HLTH 4020 Principles of Health Fitness 4 (3) Students apply current theories concerning physiological effects of exercise to select populations; understand the relationship between exercise and various chronic diseases; and design, execute, and evaluate exercise programs in terms of safety and effectiveness. Students must be certified in CPR to enroll in this course. *Preq:* HLTH 3980. *Preq or concurrent enrollment:* BIOL 2230. *Coreq:* HLTH 4021.

HLTH 4021 Principles of Health Fitness Laboratory 0 (1) Non-credit laboratory to accompany HLTH 4020. *Coreq:* HLTH 4020.

HLTH 4100 Maternal and Child Health 3 (3) Focuses on key issues concerning the health status and needs of mothers and children. Topics include primary health care, measurement and indicators of health status, health of minorities, role of families, and major programmatic interventions towards the health needs of these two groups.

HLTH 4110 Health Needs of High Risk Children 3 (3) Analysis and evaluation of health needs of high-risk families and special needs children from the prenatal period to age six. Emphasizes health maintenance and early intervention strategies. *Preq:* HLTH 4100.

HLTH 4150* Public Health Issues in Obesity and Eating Disorders 3 (3) In-depth review of prevalence, risk factors, consequences, and treatments of obesity and other eating disorders. Focuses on the public health importance of cultural norms, prevention, and early intervention related to obesity and eating disorders. *Preq:* Junior standing in Health Science.

HLTH 4180 Professional Development for CVT 3 (3) Course addresses general academic and professional development requirements for students pursuing the Cardiovascular Imaging Leadership Concentration of the Health Science degree. *Preq:* Consent of instructor.

HLTH 4190 Health Science Internship Preparation Seminar 1 (1) Preparation for internship experience. Includes topics such as resume development, interviewing skills, internship agency selection, and responsibilities of student, department, and agency. *Preq:* Junior standing in Health Science and a minimum GPA of 2.0.

HLTH 4200* Health Science Internship 1-6 (1-6) Under supervision in an approved agency, students have an opportunity for on-the-job experiences. Students are placed in an agency and develop personal/professional goals and objectives appropriate to the setting, population, and health issues. Students create a comprehensive exit portfolio in a digital format. May be repeated for a maximum of six credits. *Preq:* HLTH 4190 and a minimum grade-point average of 2.0 and Junior standing in Health Science.

- HLTH 4300* Health Promotion of the Aged 3 (3)**
Focuses on analysis and evaluation of health issues and health problems of the aged. Emphasizes concepts of positive health behaviors. Health majors are given enrollment priority. *Prq:* HLTH 2980.
- HLTH 4310 Public and Environmental Health 3 (3)**
Principles of environmental health emphasizing understanding various health concerns created by the interactions of people with their environment. Students evaluate the impact of environmental factors on public health policy decisions. Meets specific area of need in environmental health issues.
- HLTH 4400 Managing Health Service Organizations 3 (3)**
Provides the conceptual and theoretical foundation of management and organizational theory of health service organizations. Focuses on the role of health services managers and how they modify and maintain organizations.
- HLTH 4500* Applied Health Strategies 3 (3)**
Students plan, implement, and evaluate strategies to promote health through individual behavior changes. Both healthful and unhealthful behaviors are included. Examples include smoking cessation, weight management, and stress management. *Prq:* Health Science major.
- HLTH 4600 Health Information Systems 3 (3)**
Focuses on the application of information systems to patient care and management support systems. Provides a general understanding of how the information needs of health professionals and health service organizations can be met through the proper acquisition, storage, analysis, retrieval, and presentation of data.
- HLTH 4700 Global Health 3 (3)**
Deepens students' knowledge of global health and how public health work is conducted internationally. Introduction to assessment of international health needs and designing, implementing, managing, and evaluating public health programs in international settings. *Prq:* HLTH 2980.
- HLTH 4750 Principles of Health Care Operations Management and Research 3 (3)**
Provides a foundation in concepts, structure, and analysis that enables an understanding of the importance of production/operations management within health care organizations and systems. Includes training in operations research methods and objectives. *Prq:* Junior standing.
- HLTH 4780 Health Policy Ethics and Law 3 (3)**
Critical examination of the legal and ethical dimensions of public health policy formation and change and how legal, ethical, and policy considerations influence health services administration and delivery. Health majors are given enrollment priority. *Prq:* HLTH 2020 and HLTH 2400 and HLTH 2980 and HLTH 3800.
- HLTH 4790 Financial Management and Budgeting for Health Service Organizations 3 (3)**
Overview of basic principles of budgeting and financial management and analysis for health services organizations. Techniques for financial management are provided with an emphasis on health services environments. *Prq:* HLTH 4400.
- HLTH 4800 Community Health Promotion 3 (3)**
Focuses on the participatory approach in the planning and implementation of community health programs. Emphasizes professional ethics, needs assessment, coalition building, proposal writing, and implementation of special events in the community. *Prq:* HLTH 2400 and HLTH 2980.
- HLTH 4900 Research and Evaluation Strategies for Public Health 3 (3)**
Discussion of research in health. Focuses on analysis of reported research. Ethical, moral, and legal issues are discussed. *Prq:* HLTH 3800.
- HLTH 4950 Honors Thesis Seminar 3 (3)**
Senior honors thesis seminar in public health sciences. Independent research is conducted under the supervision and guidance of a faculty mentor for students enrolled in departmental honors program in support of an honors thesis/service learning research project. *Prq:* HLTH 3950 and Senior standing.
- HLTH 4960 Honors Research Colloquium 1 (1)**
Students enrolled in departmental honors present independent research conducted under the supervision of a faculty member in a public research forum to other honors students and public health professionals and/or submit a paper or presentation based on this research for publication. *Prq:* HLTH 4950 and Senior standing.
- HLTH 4970 Creative Inquiry—Public Health 1-4 (1-4)**
In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of 12 credits.
- HLTH 4980* Improving Population Health 3 (3)**
Critical examination of current and emerging issues in improving public health practice and population health. Covers examples in empirical and applied research, revealing future trends in population health. Health majors are given enrollment priority. *Prq:* HLTH 2400 and HLTH 2980 and HLTH 3800.
- HLTH 4990 Independent Study 1-3 (1-3)**
Study of selected problems in health under the direction of faculty member chosen by the student. Student and faculty member develop a course of study designed for the individual student and approved by the department chair prior to registration. May be repeated for a maximum of six credits. *Prq:* Junior standing.
- HONORS**
- HON 1900 Freshman Colloquium: Arts and Humanities (Literature) (Honors) 3 (3)**
Intellectually intensive seminar that engages freshman honors students in dialogue about the idea of the University. Explores key literary works that enhance understanding of historical eras, intellectual and artistic movements, or cultures. Topics vary. *Prq:* Membership in Calhoun Honors College.
- HON 1910 Freshman Colloquium: Arts and Humanities (Non-Literature) (Honors) 3 (3)**
Intellectually intensive seminar that engages freshman honors students in dialogue about the idea of the University. Explores historical eras, intellectual and artistic movements, or cultures emphasizing multiple tools of analysis, including literature, art, music, and film. Topics vary. *Prq:* Membership in Calhoun Honors College.
- HON 1920 Freshman Colloquium: Social Science (Honors) 3 (3)**
Intellectually intensive seminar that engages freshman honors students in dialogue about the idea of the University. Explores foundations and consequences of human thought and behavior at the individual and societal levels, with emphasis on concepts and tools that organize scholarly inquiry across the social and behavioral sciences. Topics vary. *Prq:* Membership in Calhoun Honors College.
- HON 1930 Freshman Colloquium: Cross-Cultural Awareness (Honors) 3 (3)**
Intellectually intensive seminar that engages freshman honors students in dialogue about the idea of the University. Explores traditions, customs, and value systems of peoples and cultures. Examines concepts and tools that organize scholarly inquiry into world cultures emphasizing non-Western societies. Topics vary. *Prq:* Membership in Calhoun Honors College.
- HON 1940 Freshman Colloquium: Science and Technology in Society (Honors) 3 (3)**
Intellectually intensive seminar that engages honors students in dialogue about the idea of the University. Explores interactions of the sciences and technology with society. Examines how science and technology are social enterprises and the impact of science and technology on attitudes, behaviors, and choices. Topics vary. *Prq:* Membership in Calhoun Honors College.
- HON 2010 Structures and Society (Honors) 3 (3)**
Interdisciplinary honors seminar that examines selected structures regarded as monuments to artistic creativity and technological genius and the ways that structures affect and are affected by the societies that produce them. *Prq:* Membership in Calhoun Honors College.
- HON 2020 Science, Culture, and Human Values (Honors) 3 (3)**
Interdisciplinary honors seminar that unifies natural scientific, social scientific, and humanistic disciplines into a holistic view of the modern world and its future. May be repeated for a maximum of six credits, but only if different topics are covered. *Prq:* Membership in Calhoun Honors College.
- HON 2030 Society, Art, and Humanities (Honors) 3 (3)**
Combines readings and methodologies from the social sciences, arts, and humanities to study the interrelationships among the disciplines and their societal effects. Subjects vary. May be repeated for a maximum of six credits, but only if different topics are covered. *Prq:* Membership in Calhoun Honors College.
- HON 2040 Honors Study/Travel 1 (3)**
Study/travel experience related to a three-credit Calhoun Honors Seminar. May be repeated for a maximum of three credits, but only if different topics are covered. *Prq:* Membership in Calhoun Honors College.

HON 2050 Current Issues (Honors) 1-3 (1-3)
Examination of a current issue or set of issues from a variety of academic perspectives. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Membership in Calhoun Honors College.

HON 2060 Controversies in Science and Technology (Honors) 3 (3) Interdisciplinary honors seminar that examines social issues related to science and technology, using perspectives from science, the social sciences, and humanities. May be repeated for a maximum six credits, but only if different topics are covered. *Preq:* Membership in Calhoun Honors College.

HON 2070 Reasoning, Critical Thinking, and Problem Solving (Honors) 3 (3) Interdisciplinary honors seminar that teaches a particular set of tools for thinking and analysis, showing how these tools can be applied to different kinds of problems in different disciplines. May be repeated for a maximum six credits, but only if different topics are covered. *Preq:* Membership in Calhoun Honors College.

HON 2090 Border Crossings: Experiences in World Cultures (Honors) 1-3 (1-3) Readings and studies that heighten understanding of world cultures and societies. Taken in conjunction with international educational experiences approved by Calhoun Honors College. May be repeated for a maximum of six credits, with a maximum of three credit hours per study abroad experience. *Preq:* Membership in Calhoun Honors College.

HON 2100 Experiencing the Arts (Honors) 3 (2) Interdisciplinary exploration of the arts through seminar discussions and attendance at performing and visual arts events on campus. Exploration of arts and aesthetics leading to performance previews, reviews, and experiences of Brooks Center and Lee Gallery events. May be repeated for a maximum of nine credits. *Preq:* Membership in Calhoun Honors College. *Coreq:* HON 2101.

HON 2101 Experiencing the Arts (Honors) Laboratory 0 (3) Non-credit laboratory to accompany HON 2100. *Coreq:* HON 2100.

HON 2200 Studies in Social Science (Honors) 3 (3) Discipline specific social science seminar including a disciplinary introduction (anthropology, economics, history, political science, psychology or sociology) and a detailed examination of specific theories and methods within that discipline. May be repeated for a maximum of six credits, but only if different disciplines are covered. *Preq:* Membership in Calhoun Honors College.

HON 2210 Studies in Literature (Honors) 3 (3) Introduction to selected authors and literary works focused around a specific topic. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Membership in Calhoun Honors College.

HON 2220 Studies in Arts and Humanities (Honors) 3 (3) Exploration of music, literature, film, philosophy or another area in humanities by examining a discipline specific topic. Focus may be on a particular scholar, era or culture idea or concept specific to a particular arts/humanities discipline. May be repeated for a maximum of six credits, but only if different disciplines are covered. *Preq:* Membership in Calhoun Honors College.

HON 2230 Studies in Communications (Honors) 3 (3) Explores various topics in communications. Focus may be on a particular type of communication, medium or theory. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Membership in Calhoun Honors College.

HON 2240 Global Issues (Honors) 3 (3) Exploration of various global issues across time and space. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Membership in Calhoun Honors College.

HON 4000 Honors Contract 0 (0) Advanced study and research taken in conjunction with any 3000- or 4000-level course. Contract requires prior approval by instructor and Honors Director. To be taken Pass/No Pass only. May be repeated once, but only if in conjunction with a different course. *Preq:* Membership in Calhoun Honors College.

HON 4010 Interdisciplinary Honors Independent Study 1 (1) Independent study taken in conjunction with another undergraduate course as part of the student's approved interdisciplinary honors program. *Preq:* Membership in Calhoun Honors College.

HON 4990 Honors Research 1-12 (1-12) Honors directed research in an academic discipline. Topics include, but are not limited to, literature review, research design and execution, and reporting of results. May be repeated for a maximum of 12 credits. *Preq:* Membership in Calhoun Honors College.

HORTICULTURE

Professors: J.W. Adelberg, H. Liu, L.B. McCarty, T. Whitwell, G. Zehnder; *Associate Professors:* J.E. Faust, D. Park; *Assistant Professor:* D. Thavarajah; *Extension Associates:* R. Polowski, E. Vincent

HORT 1010 Horticulture 3 (3) Environmental factors and horticultural practices affecting optimum production of floral, fruit, ornamental, and vegetable crops. Includes a survey of the various areas of horticulture and their importance to society.

HORT 1020 Experience Horticulture 1 (2) Students experience the art, science, business, and diversity of horticulture through visits to greenhouses, nurseries, botanical gardens, athletic fields, golf courses, orchards, farms, and research fields and laboratories. Students learn about horticulture from a cross section of professionals sharing their work experiences. *Preq:* Freshman or sophomore standing in Horticulture or Turfgrass.

HORT 2020 Selected Topics 1-3 (1-3) Introduction to developing trends, concepts or technologies in horticulture and/or turfgrass. May be repeated for a maximum of three credits, but only if different topics are covered. *Preq:* Consent of instructor.

HORT 2080 Landscape Appreciation 3 (3) Deepens students' appreciation of natural and built environments through a study of landscape elements, styles, and professions. Landscapes ranging in scale from residential to regional are critiqued, and design principles and landscape ethics are discussed.

HORT 2100 Growing Garden Plants in the Fall 3 (2) Focuses on growing techniques for the production of ornamental and edible horticultural crops during the fall growing season. Lectures focus on scheduling, fertilization, irrigation, integrated pest management and marketing. Labs focus on providing hands-on opportunities to identify and grow flowering crops and vegetables in greenhouses and the field. *Preq:* HORT 1010. *Coreq:* HORT 2101.

HORT 2101 Growing Garden Plants in the Fall Laboratory 0 (3) Non-credit laboratory to accompany HORT 2100. *Coreq:* HORT 2100.

HORT 2110 Growing Garden Plants in the Spring 3 (2) Focuses on growing techniques for the production of ornamental and edible horticultural crops during the spring growing season. Includes scheduling, manipulation of vegetative growth and flowering, nutritional management and plant growth regulation. Labs focus on providing hands-on opportunities to grow flowering crops and vegetables in the greenhouse and field. *Preq:* HORT 2100. *Coreq:* HORT 2111.

HORT 2111 Growing Garden Plants in the Spring Laboratory 0 (3) Non-credit laboratory to accompany HORT 2110. *Coreq:* HORT 2110.

HORT 2120 Introduction to Turfgrass Culture 3 (3) Studies of the introductory principles associated with the art and science of turfgrass culture. Develops an understanding of the history and evolution of turfgrasses and turfgrass culture. Explores career potentials in turfgrass management. Explains the basic scientific principles and techniques associated with the propagation and establishment of fine turfgrasses. *Preq:* BIOL 1030 and BIOL 1040.

HORT 2130 Turfgrass Culture Laboratory 1 (2) Provides hands-on activities and understanding of basic principles and techniques in turfgrass culture. Students learn all phases of turfgrass management including identification, turfgrass culture, common turfgrass pest identification and control. *Preq or concurrent enrollment:* HORT 2120.

HORT 2710 Internship 1-6 (1-6) Preplanned, practical, supervised work experience to give beginning students on-the-job learning opportunities that support classroom experience. Students submit monthly reports and present a departmental internship seminar. Undergraduates may accumulate a maximum of six credits for participation in HORT 2710 and/or 4710. *Preq:* Consent of instructor.

HORT 3030 Landscape Plants 3 (2) Woody, ornamental plants and their aesthetic and functional uses in landscape developments. Study covers habit of growth, ultimate size, texture effect, period of bloom, color, and cultural requirements. *Coreq:* HORT 3031.

HORT 3031 Landscape Plants Laboratory 0 (3) Non-credit laboratory to accompany HORT 3030. *Coreq:* HORT 3030.

HORT 3040 Annuals and Perennials 3 (2) Annual and perennial flowers' aesthetic appeal and functional uses and needs. Color, texture, bloom time, form, size, and growth requirements as they relate to designing, planting, and maintaining colorful landscapes. *Preq:* HORT 2080 and HORT 3030. *Coreq:* HORT 3041.

- HORT 3041 Annuals and Perennials Laboratory 0 (3)** Non-credit laboratory to accompany HORT 3040. *Coreq:* HORT 3040.
- HORT 3080 Sustainable Landscape Design, Installation and Maintenance 3 (3)** Landscape planning of gardens using environmentally sensitive design, construction, and maintenance practices. Survey skills to obtain user perception and preference and environmental measurement skills are introduced. Offered fall semester only. *Preq:* HORT 1010.
- HORT 3090 Sustainable Landscape Garden Design Laboratory 1 (3)** Landscape garden design using sustainable environmentally sensitive concepts and practices. Techniques of sustainable landscape garden design including hand drawing, site assessment, client interview, user perception survey, plant selection, and professional presentation. Plant selection encourages establishing healthy ecosystems. Emphasis on interactions between design, installation, and maintenance phases. *Preq* or *concurrent enrollment:* HORT 3080.
- HORT 3100 Growing Landscape Plants 3 (2)** Principles, technologies, and techniques of landscape plant production and growth including environmental control and manipulation, water, nutrient and pest management, scheduling, propagation, and plant problem diagnostics. Emphasizes herbaceous ornamentals along with significant woody landscape plants. *Preq:* HORT 1010. *Coreq:* HORT 3101.
- HORT 3101 Growing Landscape Plants Laboratory 0 (3)** Non-credit laboratory to accompany HORT 3100. *Coreq:* HORT 3100.
- HORT 4000 Selected Topics 1-6 (1-6)** Advanced study of any aspect of horticulture and/or turfgrass not addressed in other courses. May be repeated for a maximum of six credits, but only if different topics are covered.
- HORT 4040* Plant Propagation 3 (3)** Practices of plant propagation from seeds, bulbs, divisions, layers, cuttings, grafting, and plant tissue culture are introduced. Physiological principles of pollination and seed biology, plant growth, regulators, source sink relations, life cycles and developmental phase transitions explain the practices. Environmental and economic contexts frame the preferred practices.
- HORT 4050* Plant Propagation Techniques Laboratory 1 (3)** Techniques of plant propagation, including sexual methods: germination, scarification, and stratification. Asexual methods, including grafting, budding, cuttings, layering, tissue culture divisions, and separations. Students visit local nurseries. *Preq* or *concurrent enrollment:* HORT 4040.
- HORT 4080 Horticulture Discovery and Inquiry 1-3 (1-3)** Students learn about horticulture through research, service learning, and/or creative inquiry projects. They explore a topic of interest with faculty, organize a quality proposal, complete the project, and report results to appropriate professional audiences. May be repeated for a maximum of nine credits.
- HORT 4090 Senior Capstone Course 3 (3)** Student cognitive, affective and psychomotor learning (skills) in the field of environmental horticulture is assessed using real world professional situations requiring the command, analysis and synthesis of knowledge and skills acquired during the undergraduate experience. *Preq:* Senior standing in Horticulture.
- HORT 4120* Advanced Turfgrass Management 3 (2)** Advanced principles and practices associated with turfgrass management for golf courses, sports fields, sod production, and commercial lawn care. Topics include turfgrass physiology, plant growth and development, construction, turfgrass nutrition, irrigation, drainage, pesticide use and fate, and development of effective management systems. *Preq:* PES 2020 or HORT 2120. *Coreq:* HORT 4121.
- HORT 4121* Advanced Turfgrass Management Laboratory 0 (3)** Non-credit laboratory to accompany HORT 4120. *Coreq:* HORT 4120.
- HORT 4200* Applied Turfgrass Physiology 3 (3)** Advanced course in turfgrass science and management. Provides the current status and development of turfgrass stress physiology and research. Main topics include temperature, drought, traffic, edaphic stresses, new developments in the turf industry and environmental stewardship. *Preq:* HORT 2120, and HORT 2130.
- HORT (FOR) 4270* Urban Tree Care 3 (3)** Principles, practices, and problems of protecting and maintaining trees in urban and recreational areas. Examines environmental and biological factors affecting trees in high-use areas, their management and cultural requirements, and the practices necessary for their protection and care as valuable assets in the landscape. May also be offered as FOR 4270. *Preq:* FOR 2050 or HORT 3030.
- HORT (PES) 4330* Landscape and Turf Weed Management 3 (2)** Weed management strategies that include cultural, biological, and chemical methods are studied for landscape and turfgrass areas. Problem-solving skills and herbicide characteristics are emphasized. May also be offered as PES 4330. *Coreq:* HORT 4331.
- HORT (PES) 4331* Landscape and Turf Weed Management Laboratory 0 (2)** Non-credit laboratory to accompany HORT 4330. May also be offered as PES 4331. *Coreq:* HORT 4330.
- HORT 4550* Just Fruits 3 (3)** Students explore the origins, biology, culture, and production of major temperate zone fruit—apples, berries, and cherries to pawpaws, peaches, and pomegranates, the familiar to the forbidden. They discover principles, practices, and technologies employed to grow, protect, and harvest the fruits that feed us from commercial orchards, organic farms, and backyards. *Preq:* HORT 1010.
- HORT 4560* Vegetable Crops 3 (3)** Introduction to vegetable production, value-added products and nutrition using a farm-to-table approach. Provides an overview of vegetable production (small to large scale), the links between agriculture and human health, and the concept of value addition. Attention is given to the nutritious, whole-food benefits of vegetables and how they are used to reduce global protein-, calorie- and micronutrient-malnutrition.
- HORT 4610* Advanced Landscape Garden Design 4 (3)** Garden design for urban or other highly visible locations. A specific specialty garden with environmental education potential will be designed. Finished plans include detailed planting, installation and maintenance, and communication. Emphasis is on establishing healthy plant communities, habitat linkages, and healthy water and soil. Includes Honors sections. *Preq:* HORT 3080 and HORT 3090. *Coreq:* HORT 4611.
- HORT 4611* Advanced Landscape Garden Design Laboratory 0 (3)** Non-credit laboratory to accompany HORT 4610. *Coreq:* HORT 4610.
- HORT 4650* Plant Molecular Biology 3 (3)** Study of fundamental plant processes at both the cellular and molecular levels. Topics include genome structure and organization (both nuclear and organelar); regulation of gene expression and its role in cellular and whole-plant processes; transposable genetic elements; applications for biotechnology. *Preq:* Junior standing; and GEN 3020; and either BIOL 3040 or BIOL 3050.
- HORT 4710* Advanced Internship 1-6 (1-6)** Preplanned work experience under competent supervision in approved agency dealing with horticultural endeavors. Gives advanced students on-the-job learning opportunities to apply acquired knowledge and skills. Monthly reports and final departmental seminar required. Undergraduates may accumulate a maximum of six credits for participation in HORT 2710 and/or 4710. *Preq:* Junior standing.
- HORT 4720* Landscapes + Health 3 (3)** Explores the role of landscapes in human health and wellness. Historical healing places and contemporary urban environments are examined for evidence of psychological and physiological impacts. Readings include interdisciplinary research. *Preq:* Senior standing.

HUMANITIES

Professor: S.K. Eisiminger; *Associate Professor:* A. Bennett

HUM 3010 Humanities 3 (3) Introduction to humanistic studies focusing on relationships among disciplines—painting, sculpture, architecture, music, literature, philosophy, and drama—beginning with prehistory and continuing to the Renaissance.

HUM 3020 Humanities 3 (3) Introduction to humanistic studies focusing on relationships among disciplines—painting, sculpture, architecture, music, literature, philosophy, and drama—beginning with the 17th century and continuing to the present.

HUM 3060 Creative Genius in Western Culture 3 (3) Investigation of creativity through study of great innovators in art, literature, music, and ideas. May be repeated once for credit.

HUM 3090 Studies in Humanities 3 (3) Interdisciplinary approach to the humanities. Special subject matter varies according to the instructor and as approved by the chair of the English Department. May be repeated once for credit.

HUM (ENGL) 4560* Literature and Arts of the Holocaust 3 (3) Addresses the Holocaust through literature, art, architecture, music, and film. Beginning with historical, political, and economic forces that contributed to the Holocaust, course then focuses on highly diverse creative responses to this event - responses that often reflect the difficulties and politics of these commemorative gestures. May also be offered as ENGL 4560. *Prq:* ENGL 3100.

INDUSTRIAL ENGINEERING

Professors: W.G. Ferrell Jr., A.K. Gramopadhye, S.J. Mason, J.C. Smith, *Chair*; *Associate Professors:* B.R. Cho, B. Eksioğlu, S. Eksioğlu, J.S. Greenstein, M.E. Kurz, B.J. Melloy, K.M. Taafe; *Assistant Professors:* A. Khademi, D.M. Neyens, S. Riggs; *Research Assistant Professors:* K. Chalil Madathil, A.K. Childers; *Lecturers:* R. Riggs

IE 2000 Sophomore Seminar in Industrial Engineering 1 (1) Addresses the industrial engineering program, best student practices, and career paths. Invited lecturers, as needed, and faculty provide lectures and demonstrations. *Prq:* ENGR 1060 or ENGR 1090, each with a C or better.

IE 2100 Design and Analysis of Work Systems 3 (2) Introduction to the tools and techniques used to design and analyze work systems for human use, including process improvement, workplace design and an introduction to the field of human factors and ergonomics. *Prq:* ENGR 1060 with a C or better; and either ENGL 1020 or ENGL 1030 with a C or better. *Coreq:* IE 2101.

IE 2101 Design and Analysis of Work Systems Laboratory 0 (3) Non-credit laboratory to accompany IE 2100. *Coreq:* IE 2100.

IE 2680 Creative Inquiry Seminar in Industrial Engineering 1 (1) Students are introduced to creative inquiry methods, resources, and current activities in a seminar format. To be taken Pass/No Pass only. Includes Honors sections.

IE 2800 Deterministic Operations Research 3 (3) Introduction to operations research models, including linear programming, integer linear programming, transportation and assignment problems, and network flows. *Prq:* MATH 1060 or MATH 1070 with a C or better.

IE 3000 Junior Honors Seminar 1 (1) Acquaints students enrolled in the Departmental Honors Program with current research issues in the profession. This assists students in preparing a research proposal for the senior thesis. *Prq:* Junior standing and admission to Departmental Honors Program.

IE 3010 Systems Design I 4 (3) Introduction to the design of industrial engineering systems. Design methodologies are introduced in the context of a design process that includes identifying user needs; developing a design specification; generating, evaluating, refining, and selecting design concepts; detail design; constructing, testing, and refining prototypes; and delivering the product to the customer. *Prq:* ENGR 1060 with a C or better; and ENGL 1020 or ENGL 1030 with a C or better. *Coreq:* IE 3011.

IE 3011 Systems Design I Laboratory 0 (3) Non-credit laboratory to accompany IE 3010. *Coreq:* IE 3010.

IE 3600 Industrial Applications of Probability and Statistics I 3 (3) Introduces central concept that overall system performance can be improved by taking uncertainty into account, especially through the reduction of variability. Specific industrial applications, such as decision analysis, reliability and probabilistic inventory models, are emphasized. *Prq:* MATH 2060.

IE 3610 Industrial Applications of Probability and Statistics II 3 (3) Introduces central concept that apparent conflict between productivity and quality can be resolved through improvements in processes by introducing statistical thinking. Specific industrial applications, such as (static) simulation, quality control and reliability models, are emphasized. *Prq:* IE 3600.

IE 3680 Professional Practice in Industrial Engineering 1 (1) Seminar to orient students to issues of professional development and professional practice of industrial engineering.

IE 3810 Probabilistic Operations Research 3 (3) Probabilistic modeling of engineering systems. Topics include calculus-based probability, Markov processes, Poisson processes, queueing, and other selected topics. *Prq:* IE 2800 and IE 3600.

IE 3840 Engineering Economic Analysis 3 (3) Basic principles and techniques of economic analysis of engineering projects. Consideration of time, value of money, short- and long-term investments, replacement analysis, depreciation methods, cost allocation, and measures of cost effectiveness. *Prq:* MATH 1080.

IE 3860 Production Planning and Control 3 (3) Fundamentals of forecasting demand, scheduling production, and controlling the movement and storage of material associated with production are studied. State-of-the-art manufacturing techniques are discussed. *Prq:* IE 2800 or MATH 4400.

IE 4000* Honors Thesis 1-6 (1-6) Individual or joint research project performed with a faculty mentor or committee of faculty. May be repeated for a maximum of six credits. *Prq:* IE 2680 and consent of mentor.

IE 4020 Creative Inquiry Research 1-6 (1-6) Research experience promoting reasoning, critical thinking, ethical judgment, communication skills, and an understanding of the scientific method and engineering design. These applied/basic research experiences are usually undertaken with a team under the mentorship of a faculty member or advanced graduate student. May be repeated for a maximum of six credits. *Prq:* Consent of mentor.

IE 4030 Creative Inquiry Project 1-3 (1-3) Project-oriented experience promoting reasoning, critical thinking, ethical judgment, communication skills, and an understanding of the scientific method and engineering design. Typical experiences include design projects in cooperative education or sponsored student competitions undertaken with a team, under the mentorship of a faculty member or advanced graduate student. May be repeated for a maximum of three credits. *Prq:* IE 2680 and consent of mentor.

IE 4300* Human Factors Engineering in Healthcare 3 (3) Focuses on how industrial engineers help improve the quality and safety of patient care. Students learn how healthcare is different from traditional industrial engineering sectors. A substantial part of the course is focused on learning how to apply industrial engineering tools, specifically those grounded in human factors, to healthcare problems. *Prq:* IE 2100 or IE 4880 or PSYC 3640 or PSYC 3680 or PSYC 4350.

IE 4400* Decision Support Systems in Industrial Engineering 3 (2) Study of design of decision support systems for production and service systems based on operations research models. Includes use of spreadsheets, databases, and integrated software development environments to implement decision support systems. *Prq:* ENGR 1090; or both CHE 1300 and one of CPSC 1010 or CPSC 1110 or CPSC 1610. *Coreq:* IE 4401.

IE 4401* Decision Support Systems in Industrial Engineering Laboratory 0 (3) Non-credit laboratory to accompany IE 4400. *Coreq:* IE 4400.

IE (MGT) 4440 International Perspectives in Industrial Management 1-6 (1-6) Provides an international perspective to industrial management via organized plant visits to businesses in a foreign country and lectures by and discussions with senior operations managers. Cultural visits and lectures are also organized to provide a holistic perspective to cover cultural and economic environment of the host country. Students are responsible for travel costs. May be repeated for a maximum of six credits. May also be offered as MGT 4440. *Prq:* Consent of instructor.

IE 4460 Modeling and Analysis of Manufacturing Systems 3 (3) Promotes competence in developing and applying quantitative models to improve the design and operation of manufacturing and assembly systems. Emphasis is placed on the underlying principles and analytical models for guiding how resources (humans, machines, tools, information) should be utilized to facilitate the flow of production jobs through a facility. *Prq:* IE 2800 and IE 3810 and IE 4400.

IE 4520* Reliability Engineering 3 (3) Probabilistic approach to assessing system reliability. Methods for analyzing serial, parallel, and complex systems. Reliability life testing and its acceleration are covered. Essential elements of maintainability are identified and related to system availability. *Prq:* IE 3610; or MATH 3020 and MATH 4000.

IE 4560* Supply Chain Design and Control 3 (3) Industrial engineering aspects of supply chains, including design and control of material and information systems. *Prq:* IE 3610 and IE 3860.

IE 4570* Transportation and Logistics Engineering 3 (3) Introduces transportation and logistics systems analysis from both analytical and practical perspectives. Covers methods for identifying level-of-service metrics and measuring system performance. Discusses key aspects of modeling, simulation, and other techniques for economic and quantitative analysis of transportation and logistics planning issues. *Prq:* Senior standing in an engineering, science, or management program; and MATH 1020 or MATH 1060 or MATH 1070.

IE 4600* Quality Improvement Methods 3 (3) Study of modern quality improvement techniques presented in an integrated, comprehensive context. *Preq:* MATH 1020 or MATH 1060 or MATH 1070; and junior standing.

IE 4610* Quality Engineering 3 (3) Design aspects of quality and the engineer's role in problems of quality in production systems. *Preq:* IE 3610.

IE 4620* Six Sigma Quality 3 (3) Study of DMAIC (Define, Measure, Analyze, Improve, and Control) elements of Six Sigma, project management, process analysis, quality function deployment, hypothesis testing, gage R&R, data analysis, multivariate analysis, design of experiments, statistical process control, and process capability analysis. *Preq:* One of STAT 3010 or STAT 4110 or IE 3600 or MATH 3010 or MATH 3020 or MATH 3090 or CHE 3070.

IE 4630* Quality in the Capital Projects Industry 3 (3) Covers topics in quality and lean principles relevant to the capital projects industry. Provides a broad overview on quality concepts and philosophies, quality management and inspection tools applicable to capital projects, Six Sigma Approach, lean concepts and value stream mapping. *Preq:* MATH 1020 or MATH 1060 or MATH 1070; and junior standing.

IE 4650* Facilities Planning and Design 3 (3) Study of the principles and techniques of facility planning and design. Discusses economic selection of materials handling equipment and integration of this equipment into the layout plan to provide effective product flow in production, distribution, and service contexts. Includes quantitative techniques for evaluation of facility design. *Preq:* IE 2100 and IE 2800 and IE 3810.

IE 4670 Systems Design II 3 (2) Provides students with the challenge of integrating and synthesizing general engineering knowledge into creatively solving real-world, open-ended problems. This includes developing the problem statement, objectives, and criteria; data collection; technical analysis; developing and integrating recommendations; and presenting results. *Preq:* All of the following Industrial Engineering courses: IE 2010, 2100, 2800, 3600, 3610, 3680, 3810, 3840, 3860, 4400, 4610, 4650, and 4820. *Coreq:* IE 4671.

IE 4671 Systems Design II Laboratory 0 (3) Non-credit laboratory to accompany IE 4670. *Coreq:* IE 4670.

IE 4690 Creative Inquiry Symposium in Industrial Engineering I (1) Provides a forum for exchange of results and ideas in creative inquiry student projects. To be taken Pass/No Pass only. *Preq:* IE 3680.

IE 4810* Applications of Probability Models in Industrial Engineering 3 (3) This second probabilistic operations research course provides a broader, more applied range of topics than the first (IE 3810 or IE 8030). Potential topics include decision making; utility theory; portfolio risk; optimization and hedging; inventory models for perishable products; revenue management; risk analysis; and static simulation. *Preq:* IE 2800 and IE 3600 and IE 3610 and IE 3840.

IE 4820* Systems Modeling 4 (4) The purpose, theory, and techniques of modeling systems with dynamic events. Students learn a powerful analytical process to use in the analysis and improvement of systems in several industries, including transportation, logistics, manufacturing and service systems. Incorporates professional simulation software as a tool in evaluating the system performance. *Preq:* IE 3610 and 3810; or MATH 4400 and MATH 4410 and MATH 3020.

IE 4840 Applied Engineering Economics 3 (3) Application of principles and techniques required to perform economic analysis of engineering projects in various sectors, such as manufacturing, public sector or the service sector. Topics include replacement analysis, project selection and selecting an analysis technique. *Preq:* One of CE 3520 or IE 3840; and one of IE 2800 or MATH 4400; and one of IE 3600 or MATH 4000; and one of IE 3610 or MATH 3020.

IE 4850* Survey of Optimization Methods and Applications 3 (3) Survey of deterministic and stochastic optimization methods, theory and algorithms. Modeling, analysis and applications of optimization to modern industrial engineering problems. *Preq:* One of IE 2800 or MATH 4400; and one of IE 3810 or MATH 4410.

IE 4860* Scheduling 3 (3) Introduction to the development and application of operations research approaches for sequencing and scheduling problems. Emphasis is placed on heuristic- and optimization-based solution methods and how they relate to practical approaches for scheduling and sequencing. Prior programming experience in any structured language or environment is required (e.g., C/C++, VBA, Matlab, etc.). *Preq:* One of IE 3860 or MGT 3900; and one of CPSC 1010 or CPSC 1110 or IE 4000 or MATH 3600 or MATH 3650.

IE 4870* Industrial Safety 3 (3) Recognition and prevention of hazards; recognition and control of hazardous materials; developing and managing a safety program; designing inherently safe equipment and workplaces. *Preq:* MATH 1020 or MATH 1060 or MATH 1070; and junior standing.

IE 4880* Human Factors Engineering 3 (3) Introduction to human performance and limitations in the design of effective and efficient systems. Covers issues related to changes in technology, impact of design on society, ethical issues in design of systems, and the cost benefits from designing systems and environments that often challenge perceived notions of benefits. *Preq:* Junior standing; and MATH 1020 or MATH 1060 or MATH 1070.

IE 4890* Industrial Ergonomics and Automation 3 (2) Physical ergonomics and ergonomics in industrial settings, including work physiology, the physical environment, automated systems, and hybrid work systems. *Preq:* IE 2100. *Coreq:* IE 4891.

IE 4891* Industrial Ergonomics and Automation Laboratory 0 (3) Non-credit laboratory to accompany IE 4890. *Coreq:* IE 4890.

IE 4910* Selected Topics in Industrial Engineering 3 (3) Comprehensive study of any timely or special topic in industrial engineering not included in other courses. May be repeated for a maximum of 12 credits. Includes Honors sections.

INTEGRATED PEST MANAGEMENT

Professor: R.G. Bellinger

IPM 4010* Principles of Integrated Pest Management 3 (3) Origins, theory, and practice of integrated pest management. Relationships among crop production and protection practices are explored. Economics of various control strategies are considered. Integrated pest management field projects are studied. Conventional and integrated pest management approaches are compared. Multidisciplinary plant problem analysis is introduced. *Preq:* ENT 3010 or PES 4070 or PLPA 3100.

INTERNATIONAL STUDIES

IS 1010 Cross-Cultural Awareness International Experience 0 (0) Study of cross-cultural awareness as part of an international/study abroad experience. Minimum duration of the study abroad experience is four weeks. May be repeated. To be taken Pass/No Pass only.

IS 2100 Selected Topics in International Studies 3 (3) Topics in cross-cultural awareness and intercultural communications are studied in situ as part of a study abroad program. Addresses the impact of culture on behavior in intercultural contact in professional and personal contexts. May be repeated for a maximum of six credits, but only if different topics are covered.

ITALIAN

Lecturers: V. Lombardi, J. Schmidt

ITAL 1010 Elementary Italian 4 (3) Introductory course stressing grammar, pronunciation, oral practice, and reading skills. Attention is given to practical everyday living as well as cultural considerations. *Coreq:* ITAL 1011.

ITAL 1011 Elementary Italian Laboratory 0 (1) Non-credit laboratory to accompany ITAL 1010. *Coreq:* ITAL 1010.

ITAL 1020 Elementary Italian 4 (3) Continuation of ITAL 1010. *Preq:* ITAL 1010. *Coreq:* ITAL 1021.

ITAL 1021 Elementary Italian Laboratory 0 (1) Non-credit laboratory to accompany ITAL 1020. *Coreq:* ITAL 1020.

ITAL 2010 Intermediate Italian 3 (3) Intermediate course to build on the foundation of previous language courses, with practice in listening, speaking, reading, and writing. Introduction to cultural perspectives through readings of literary prose selections. Includes Honors sections. *Preq:* ITAL 1020. *Coreq:* ITAL 2011.

ITAL 2011 Intermediate Italian Laboratory 0 (1) Non-credit laboratory to accompany ITAL 2010. *Coreq:* ITAL 2010.

ITAL 2020 Intermediate Italian 3 (3) Increasingly difficult readings in Italian literature, supplemented with classroom discussions and compositions. Includes Honors sections. *Preq:* ITAL 2010. *Coreq:* ITAL 2021.

ITAL 2021 Intermediate Italian Laboratory 0 (1) Non-credit laboratory to accompany ITAL 2020. *Coreq:* ITAL 2020.

- ITAL 2970 Creative Inquiry—Italian 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration. *Preq:* Consent of faculty member.
- ITAL 3010 Introduction to Italian Literature 3 (3)** Study of selected texts of Italian literature in their artistic, cultural, and social context. May include theme and genre studies. *Preq:* ITAL 2020.
- ITAL 3020 Modern Italian Literature 3 (0)** Study of selected works from major 19th- and 20th-century Italian authors, including Manzoni, Verga, Svevo, Moravia, Ginzburg. *Preq:* ITAL 2020.
- ITAL 3050 Intermediate Italian Conversation and Composition 3 (3)** Practice in the written and spoken language with emphasis on vocabulary, pronunciation, and comprehension. *Preq:* ITAL 2020.
- ITAL 3070 Italian Civilization and Culture 3 (3)** Study of the significant aspects of Italian civilization and culture through analysis of literary texts, paintings, films, and magazine articles. *Preq:* ITAL 2020.
- ITAL 3600 Italian Literature to 1600 3 (3)** Examines selected topics in Italian literature from the Middle Ages to 1600. Readings include works by Dante, Boccaccio, Petrarca, Franco, Castiglione and Machiavelli. *Preq or concurrent enrollment:* ITAL 3020 or ITAL 3050.
- ITAL 3970 Creative Inquiry—Italian 1-4 (1-4)** Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.
- ITAL 3980 Directed Reading 1-3 (1-3)** Directed study of selected topics in Italian literature, language, and culture. May be repeated for a maximum of six credits. *Preq:* Consent of department chair.
- ITAL 4000 Image of an Italian City 3 (3)** Study of historical, social, and architectural images of Italian cities through analysis of literary texts and films. *Preq:* ITAL 2020.
- ITAL 4050 Advanced Italian 3 (3)** Advanced language study emphasizing fluency in oral and written expression through discussion and analysis of contemporary Italian media. *Preq:* One 3000-level Italian course.
- ITAL 4550 Italian Film 3 (2)** Overview of Italian cinema. Topics may include history, genres, and major directors. *Preq:* ITAL 3050. *Coreq:* ITAL 4551.
- ITAL 4551 Italian Film Laboratory 0 (3)** Non-credit laboratory to accompany ITAL 4550. *Coreq:* ITAL 4550.
- ITAL 4750 Advanced Italian Seminar 3 (3)** Concentrated research and discussion on advanced topics in Italian literature, film, art, or drama. May be repeated for a maximum of six credits. *Preq:* One 4000-level Italian course.
- ITAL 4970 Creative Inquiry—Italian 1-4 (1-4)** Continuation of research initiated in ITAL 3970. Students complete their project and disseminate their research results. *Preq:* ITAL 3970.
- ITAL 4980 Selected Topics 3 (3)** Study of selected topics in Italian literature, language, and culture. Taught in Italian. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Consent of department chair.
- JAPANESE**
Lecturers: T. Joerger, K. Shoji
- JAPN 1010 Elementary Japanese 4 (3)** Course for beginners in which fundamentals are taught and a foundation is provided for further study and the eventual ability to read and speak the language. The Japanese writing system is introduced. Students learn how to recognize and write the two alphabets Hiragana and Katakana. Three hours a week of classroom instruction and one hour a week in the language laboratory. *Coreq:* JAPN 1011.
- JAPN 1011 Elementary Japanese Laboratory 0 (1)** Non-credit laboratory to accompany JAPN 1010. *Coreq:* JAPN 1010.
- JAPN 1020 Elementary Japanese 4 (3)** Continuation of JAPN 1010. Students study Kanji characters. *Preq:* JAPN 1010. *Coreq:* JAPN 1021.
- JAPN 1021 Elementary Japanese Laboratory 0 (1)** Non-credit laboratory to accompany JAPN 1020. *Coreq:* JAPN 1020.
- JAPN 2010 Intermediate Japanese 3 (3)** Brief review of JAPN 1010 and 1020, with conversation, composition, and beginning of more serious reading of Japanese in short stories. Students study Kanji characters. *Preq:* JAPN 1020. *Coreq:* JAPN 2011.
- JAPN 2011 Intermediate Japanese Laboratory 0 (1)** Non-credit laboratory to accompany JAPN 2020. *Coreq:* JAPN 2010.
- JAPN 2020 Intermediate Japanese 3 (3)** Brief review of JAPN 2010, with conversation, composition, and dictation based on more difficult Japanese reading selections. Includes a continuation of Kanji characters. *Preq:* JAPN 2010. *Coreq:* JAPN 2010.
- JAPN 2021 Intermediate Japanese Laboratory 0 (1)** Non-credit laboratory to accompany JAPN 2020. *Coreq:* JAPN 2020.
- JAPN 2970 Creative Inquiry—Japanese 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration. *Preq:* Consent of faculty member.
- JAPN 3030 Intensive Conversation and Composition in Japan 3 (3)** Study of Japanese with native instructors at a university in Japan. All coursework conducted in Japanese. May be repeated for a maximum of six credits. *Preq:* JAPN 2020.
- JAPN 3050 Japanese Conversation and Composition 3 (3)** Practice in the spoken language with emphasis on vocabulary, Kanji, pronunciation, and comprehension; learning practical language skills and intercultural communication through various topics. *Preq:* JAPN 2020.
- JAPN 3060 Japanese Conversation and Composition 3 (3)** Continuation of JAPN 3050. More practice in the spoken language emphasizing vocabulary, Kanji, pronunciation, and comprehension. Learning practical language skills and intercultural communication through various topics. *Preq:* JAPN 3050.
- JAPN 3070 Japanese Civilization I 3 (3)** Study of the significant aspects of the culture of Japan. *Preq:* JAPN 2020.
- JAPN 3080 Japanese Civilization II 3 (3)** Study of significant aspects of the culture of Japan. *Preq:* JAPN 2020.
- JAPN 3160 Japanese for International Trade I 3 (3)** Spoken and written Japanese common to the Japanese-speaking world of business and industry emphasizing business practices and writing and translating business letters and professional reports. Cross-cultural references provide opportunity for comparative and contrastive analysis of American and Japanese cultural patterns in a business setting. *Preq:* JAPN 3060.
- JAPN 3970 Creative Inquiry—Japanese 1-4 (1-4)** Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.
- JAPN 3980 Directed Reading 1-3 (1-3)** Directed study of selected topics in Japanese literature, language, and culture. May be repeated for a maximum of six credits. *Preq:* Consent of department chair.
- JAPN 4010 Japanese Literature in Translation 3 (3)** Introduction to Japanese literature from 712 AD to the present. Cultivates an appreciation for Japanese literature and culture. All readings and discussions are in English. May not be used to satisfy general foreign language requirements.
- JAPN 4030 Internship in Japan 3 (3)** Minimum of one month of full-time work experience in Japan. All work activities with host companies are conducted in Japanese. May be repeated for a maximum of six credits. *Preq:* JAPN 2020.
- JAPN 4040 Cultural Studies in Japan 3 (3)** Study of Japanese cultural topics on site in Japan through lectures, field trips, small student group reconnaissance excursions, and reporting sessions. All activities are conducted in Japanese. May be repeated for a maximum of six credits. *Preq:* JAPN 2020.
- JAPN 4060 Introduction to Japanese Literature 3 (3)** Students read contemporary Japanese narrative fiction, poetry, and drama in their historical and social context. *Preq:* 3000-level Japanese course.
- JAPN 4110 Studies in the Japanese Language I 3 (3)** Advanced training in the spoken and written language with emphasis on formal expressions. *Preq:* JAPN 3060.
- JAPN 4120 Studies in the Japanese Language II 3 (3)** In-depth study of Kanji characters. *Preq:* JAPN 4110.
- JAPN 4160 Japanese for International Trade II 3 (3)** Study of language and cultural environment of the Japanese-speaking market, including the linguistic and cultural idioms that support global marketing in general and the international marketing of textiles, agricultural products, and tourism in particular. *Preq:* JAPN 3160.
- JAPN (ANTH) 4170 Japanese Culture and Society 3 (3)** Focuses on basic themes in Japanese culture found in social interaction and ritual behavior. Japanese social organization, including marriage and family patterns, neighborhood and community organization, and gender roles receive extensive attention. All readings and discussions are in English. May not be used to satisfy general foreign language requirements. May also be offered as ANTH 4170.
- JAPN 4900 Classical Japanese 3 (3)** Examination and analysis of premodern Japanese texts. Special emphasis is on the grammar and syntax of the classical language, its divergence from and influence upon the modern idiom. All coursework is conducted in Japanese. *Preq:* JAPN 3060.

JAPN 4910 Senior Seminar in Japanese Literature 3 (3) Close readings of various works of premodern and modern Japanese literature. Includes study of important authors and their representative works in prose and poetry. Familiarizes students with the cultural and linguistic nuances of literature in the original language. All readings and activities are in Japanese. *Preq:* JAPN 3060.

JAPN 4970 Creative Inquiry—Japanese 1-4 (1-4) Continuation of research initiated in JAPN 3970. Students complete their project and disseminate their research results. *Preq:* JAPN 3970.

JAPN 4990 Selected Topics in Japanese Culture 3 (3) Topic-generated examination of fundamental cultural themes in premodern and modern Japan, including, but not limited to, such topics as Japanese drama, poetry, prose, religious traditions, cinema, and folklore/mythology. May be repeated for a maximum of six credits, but only if different topics are covered. Readings and discussions are in English. May not be used to satisfy general foreign language requirements.

JUSTICE STUDIES

JUST 4280 Criminal Law 3 (3) Comprehensive exploration of substantive criminal laws at both the state and federal levels. Topics include affirmative defenses, elements of individual crimes, and judicially created legal doctrines, such as the Exclusionary Rule and the expectation of privacy. Constitutional principles and the application of the Bill of Rights are also examined.

JUST 4290 Justice Administration 3 (3) Comprehensive evaluation of the administration of criminal justice. The course seeks to develop an understanding of how criminal justice components operate, interact with one another, and administer justice, and explores key theoretical approaches and organizational principles, models and typologies. *Preq:* SOC 3880.

JUST 4970 Criminal Justice Senior Capstone 2 (2) Prepares students for career opportunities and the employment process, through the integration of theory, practical application, research design, and policy assessment in the criminal justice field. Students are presented with both learning assessments and tools for professional development. *Preq:* SOC 3880.

LANGUAGE

LANG 2500 Introduction to World Languages 3 (3) Introduction to fundamental questions concerning the nature and use of human language throughout the world. Emphasizes the definition, genesis and theoretical characterization of language, as well as its role in social and political discourses. All readings and discussions are in English.

LANG 2540 Introduction to World Cinemas 3 (2) Introduction to the development of cinemas outside the United States through an examination of representative works, genres and movements in their cultural contexts. Conducted in English. All films are subtitled. *Coreq:* LANG 2541.

LANG 2541 Introduction to World Cinemas Laboratory 0 (3) Non-credit laboratory to accompany LANG 2540. *Coreq:* LANG 2540.

LANG 2970 Creative Inquiry—Language 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration.

LANG 3000 Introduction to Linguistics and Foreign Language Learning 3 (3) Introduction to the field of linguistics, including the study of phonetics, phonology, morphology, syntax, and semantics. Includes discussion of issues pertaining to foreign language acquisition.

LANG 3030 Study Abroad Transfer 3-6 (3-6) Course for credit transfer of any course taken abroad during a department-approved study. Requires a minimum of two contact hours per week for at least 15 weeks or equivalent. Students may take a course outside their concentration. May be repeated for a maximum of six credits. To be taken Pass/No Pass only. *Preq:* Consent of department chair.

LANG 3400 Cosmopolis: The Myth of the City 3 (3) Cross-cultural inquiry into the idea of the city through literary, political, and philosophical texts as well as film and architecture. *Preq:* Junior standing.

LANG 3420 Sacred and Profane Bodies 3 (3) Cross-cultural inquiry into the ambivalence surrounding female sexuality implicit in images of women and, in particular, the division of women into earthly and divine categories. *Preq:* Junior standing.

LANG 3560 Faces of Evil 3 (3) Cross-cultural inquiry into evil as an ineradicable challenge to representation disclosed by notions of the monstrous, the enemy, the infinite, and death in literature, cultural theory, and the arts. *Preq:* Junior standing.

LANG (ANTH) 3710 Language and Culture 3 (3) Surveys key topics, theories, and methodological approaches in linguistic anthropology. Examines the complex relationships among language, culture, and communicative behavior and provides students with conceptual tools that inform the study of language in its cultural contexts. May also be offered as ANTH 3710.

LANG 3970 Creative Inquiry—Language 1-4 (1-4) Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.

LANG 4000* Phonetics 3 (3) Study of basic phonetic concepts used in the study of sounds in language.

LANG 4200 France and the Francophone World 3 (3) Selected masterpieces of French and Francophone Culture are considered within their historical and cultural context. All readings and instruction are in English. No knowledge of the foreign language is required. May be repeated for a maximum of six credits. Includes Honors sections. *Preq:* Sophomore standing.

LANG 4500 Risk and Danger 3 (3) Cross-cultural inquiry into the meanings of risk and danger as they are articulated in various literary and philosophical texts and films about gambling, duels, stunts, bullfights, wilderness adventure, and smoking. *Preq:* Junior standing.

LANG (ENGL) 4540 Selected Topics in International Film 3 (2) Presents subtitled films of specific world cultures and basic film theory and discourse applicable to the selected areas. Taught in English. May be repeated for a maximum of six credits with consent of department chair. May also be offered as ENGL 4540. *Preq:* ENGL 3100. *Coreq:* LANG 4541.

LANG (ENGL) 4541 Selected Topics in International Film Laboratory 0 (3) Non-credit laboratory to accompany LANG 4540. May also be offered as ENGL 4541. *Coreq:* LANG 4540.

LANG 4550 Hispanic Film: Documentary and Feature 3 (3) Overview of theory and discourse on Hispanic film. Through lectures, discussions, and films, students become acquainted with film as a vehicle for understanding the Hispanic World. Taught in English. Films are in Spanish with English subtitles. *Preq:* Sophomore standing.

LANG 4600 Propaganda and the Totalitarian Recreation of the World 3 (3) Cross-cultural inquiry into the various languages (philosophical, political, literary, and filmic, among others) that form a crucial weapon in the striving for hegemony over desire that marks the modern totalitarian project. *Preq:* Junior standing.

LANG 4620 Borders 3 (3) Cross-cultural inquiry into representations of physical and non-physical borders. Provides a theoretical framework in which various forms of borders, limits, and boundaries can be studied through literature and other artistic media. *Preq:* Junior standing.

LANG (POSC) 4850* Global Affairs and Governments 3 (3) Designed for teachers and education students who wish to learn how to incorporate global affairs more fully into high school curricula. Overview of major topics involving foreign policies and world politics is provided. May also be offered as POSC 4850.

LANG 4970 Creative Inquiry—Language 1-4 (1-4) Continuation of research initiated in LANG 3970. Students complete their project and disseminate their research results. *Preq:* LANG 3970.

LANG 4990 Language Portfolio 2 (2) Students create a digital portfolio to demonstrate competencies in reasoning, critical thinking, problem solving skills, cross-cultural awareness, ethical judgment, and to document a study abroad or internship experience. Course also serves as a resource for academic and professional development. To be taken Pass/No Pass only.

LANDSCAPE ARCHITECTURE

Professors: M.G. Padua, *Chair*, T. Schurch; *Associate Professors:* R. Hewitt, H. Nassar, M. Powers; *Assistant Professors:* H. Chang, M. Holland, P. Russell; *Visiting Assistant Professor:* D. Lycke

LARC 1150 Introduction to Landscape Architecture 3 (3) Introduction to the foundations and contemporary sources of landscape architecture. The course surveys the relationship between landscape architecture and sustainability, medicine, engineering, art, the natural sciences, planning and development, psychology, recreation and tourism, architecture, preservation, and technology.

- LARC 1160 History of Landscape Architecture 3 (3)** History of design on the land from prehistory to the present. Overview of the interface of aesthetics, science, technology, and natural features that influence cultures in shaping places.
- LARC 1280 Technical Graphics 3 (2)** Introduction to rendering techniques, plan graphics, 3-D projection drawings, drafting skills, perspective drawing, and overview of computer graphics. *Preq:* Landscape Architecture major. *Coreq:* LARC 1281.
- LARC 1281 Technical Graphics Laboratory 0 (2)** Non-credit laboratory to accompany LARC 1280. *Coreq:* LARC 1280.
- LARC 1510 Basic Design I 3 (6)** Studio introduction to design fundamentals through 2-D and 3-D application of basic systems and development of attitudes essential to the creative design process. *Preq:* Landscape Architecture major.
- LARC 1520 Basic Design II 6 (12)** Further investigations into design fundamentals through 2-D and 3-D application of basic systems and development of attitudes essential to the creative design process. *Preq:* LARC 1510.
- LARC 1990 Creative Inquiry—Landscape Architecture I 3 (3)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. *Preq:* Consent of faculty member/mentor.
- LARC 2510 Landscape Architecture Design Fundamentals 6 (1)** Compositional skills introduced in LARC 1510 and 1520 are applied to design in the landscape. Through research, design assignments and discussions, students derive and apply design principles to place, study the processes of design and develop an understanding of how design principles, plant materials and structures are used in the landscape. *Preq:* LARC 1520. *Coreq:* LARC 2511.
- LARC 2511 Landscape Architecture Design Fundamentals Laboratory 0 (10)** Non-credit laboratory to accompany LARC 2510. *Coreq:* LARC 2510.
- LARC 2520 Site Design in Landscape Architecture 6 (1)** Students apply lessons from LARC 2510 to site designs considering planting design, responsible land management strategies and appropriate use of materials. Also included are participatory and social behavioral aspects of design. Readings and seminar discussions are emphasized as integral to the design and decision making process. *Preq:* LARC 2510. *Coreq:* LARC 2521.
- LARC 2521 Site Design in Landscape Architecture Laboratory 0 (10)** Non-credit laboratory to accompany LARC 2520. *Coreq:* LARC 2520.
- LARC 2620 Design Implementation I 3 (1)** Basics of landscape architecture construction methods and construction documents, including site information gathering and analysis, basic site grading and drainage, cut and fill, principles of stormwater management, and sustainable land management related to implementation. Includes explorations in hand and computer graphic techniques used in construction drawings. *Preq:* Consent of instructor. *Coreq:* LARC 2621.
- LARC 2621 Design Implementation I Laboratory 0 (3)** Non-credit laboratory to accompany LARC 2620. *Coreq:* LARC 2620.
- LARC 2930 Field Studies Internship 1-3 (1-3)** Skill-based practical work experience to give beginning students on-the-job learning opportunities. Requires a minimum of five weeks of uninterrupted, supervised, practical experience with a preapproved commercial firm or public agency dealing with landscape architectural site issues. May be repeated for a maximum of six credits. To be taken Pass/No Pass only. *Preq:* Consent of instructor.
- LARC 2990 Creative Inquiry—Landscape Architecture II 3 (3)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. *Preq:* LARC 1990 and consent of faculty member/mentor.
- LARC 3510 Regional Design and Ecology 6 (1)** Study and analysis of natural and cultural landscapes at the regional scale. Introduction of landscape ecology as an informant to design. Basic overview of geographic information systems. Regional and ecological issues are applied in a final site design. Also includes relevant reading, discussion, and writing. *Preq:* Senior standing. *Coreq:* LARC 3511.
- LARC 3511 Regional Design and Ecology Laboratory 0 (10)** Non-credit laboratory to accompany LARC 3510. *Coreq:* LARC 3510.
- LARC 3520 Urban Design Studio 6 (1)** Landscape architectural design in the urban context. Students study urban issues and offer design solutions for urban areas. The course includes a reading and theory component, as well as an opportunity to collaborate with architecture students. Students attend an international field trip during Spring Break. *Preq:* LARC 2510. *Coreq:* 3521.
- LARC 3521 Urban Design Studio Laboratory 0 (10)** Non-credit laboratory to accompany LARC 3520. *Coreq:* LARC 3520.
- LARC 3620 Design Implementation II 3 (1)** Advanced landscape architecture construction methods and construction documents, including site information gathering, analysis, site grading and drainage, cut and fill, principles of stormwater management, sustainable land management related to implementation, materials research and use, sustainable planting strategies, site demolition and construction management. Includes explorations in appropriate graphic communication techniques. *Preq:* Consent of instructor. *Coreq:* LARC 3621.
- LARC 3621 Design Implementation II Laboratory 0 (2)** Non-credit laboratory to accompany LARC 3620. *Coreq:* LARC 3620.
- LARC 3990 Creative Inquiry—Landscape Architecture III 3 (3)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. *Preq:* LARC 2990 and consent of faculty member/mentor.
- LARC 4050* Urban Genesis and Form 3 (3)** Exploration of urban forms and developments within their historical context through off-campus, on-site lectures and exposure to historic cities and sites. Students visit historic and contemporary cities and analyze those places through readings and direct observations. Offered in the summer only. *Preq:* LARC 2520.
- LARC 4180 Off-Campus Study Seminar 1 (1)** Students study various cultural and environmental factors to inform and enhance their off-campus experiences in Istanbul, Barcelona, Genoa, or Charleston. *Preq:* Landscape Architecture major.
- LARC 4190 Off-Campus Field Study 3 (3)** Intensive study of place in an off-campus setting as context for design. Numerous class trips to significant sites in the area of the off-campus programs. Bus trips to distant sites are also planned. *Preq:* LARC 4510.
- LARC 4210 Landscape Architectural Seminar 3 (3)** Lectures and seminars dealing with pertinent topics related to environmental, technological, and theoretical issues in landscape architecture, land planning, and urban design. May be repeated for a maximum of six credits. *Preq:* Junior standing.
- LARC 4230* Environmental Issues in Landscape Architecture 3 (3)** Overview of environmental and ecological issues and their relationship to landscape architecture practice and design. *Preq:* LARC 4520.
- LARC 4280 Landscape Architecture Computer-Aided Design 3 (2)** Introduces students to the use of computer technology in the landscape architectural design process. Covers the basics of computer applications used in the industry for conceptualizing, drafting, modeling, and graphic communications. *Preq:* Landscape Architecture major. *Coreq:* LARC 4281.
- LARC 4281 Landscape Architecture Computer-Aided Design Laboratory 0 (2)** Non-credit laboratory to accompany LARC 4280. *Coreq:* LARC 4280.
- LARC 4330* Historic Preservation in Landscape Architecture 3 (3)** Study of historic landscape preservation in a number of contexts, including gardens, vernacular landscapes, parks, cemeteries, and battlefields. *Preq:* LARC 4520.
- LARC 4380 Advanced Computer-Aided Design 3 (2)** Advanced study in computer-aided design for students wishing to develop their skills beyond LARC 4280. Students develop advanced skills in illustrative drawings, construction drawings, desktop publishing, and other computer-based applications. *Preq:* LARC 4280. *Coreq:* 4381.
- LARC 4381 Advanced Computer-Aided Design Laboratory 0 (2)** Non-credit laboratory to accompany LARC 4380. *Coreq:* LARC 4380.
- LARC 4430* Community Issues in Landscape Architecture 3 (3)** In-depth study of issues relevant to community design. Overview of physical design and related social issues. *Preq:* LARC 4520.
- LARC 4510 Community Design Studio 6 (1)** Studio focused on the study and design of communities and public spaces. Students explore multicultural, historical and ecological layers of community, as well as the role of landscape management and the creative design process to add new dimensions of meaning to these places. *Preq:* LARC 3520. *Coreq:* LARC 4511.

- LARC 4511 Community Design Studio Laboratory 0 (10)** Non-credit laboratory to accompany LARC 4510. *Coreq:* LARC 4510.
- LARC 4520 Off-Campus Studio 6 (1)** Off-campus landscape architecture studio in Istanbul, Charleston, Genoa, or Barcelona. *Preq:* LARC 4510. *Coreq:* 4521.
- LARC 4521 Off-Campus Studio Laboratory 0 (10)** Non-credit laboratory to accompany LARC 4520. *Coreq:* LARC 4520.
- LARC 4530* Key Issues in Landscape Architecture 3 (3)** Overview of research in landscape architecture and study of relevant research methods. Students write proposals for their own projects positioned within the larger context of research in the profession. *Preq:* Junior standing.
- LARC 4620 Landscape Architectural Technology III 3 (2)** Advanced overview of construction materials and methods used in project implementation. Study characteristics, strengths, nominal sizes and uses of materials (asphalt, brick, concrete, stone, wood). Field trips, exercises, and preparation of construction documents develop understanding of how design ideas are realized in built form. *Preq:* LARC 3620. *Coreq:* LARC 4621.
- LARC 4621 Landscape Architectural Technology III Laboratory 0 (2)** Non-credit laboratory to accompany LARC 4620. *Coreq:* LARC 4620.
- LARC 4710 Chinese and Japanese Garden Traditions 3 (3)** This course examines Chinese and Japanese classical garden traditions within the context of the classical arts. Emphasis is placed on understanding garden design principles that deal with scenery manipulation and visualization, as well as an in-depth study of the Chinese classical design language, grammar and vocabulary. *Preq:* Junior standing.
- LARC 4720 South Carolina's Landscapes: Then and Now 3 (3)** This course investigates South Carolina's designed and cultural landscapes. It addresses the human impacts and settlement patterns, the state's natural and physical environments, and focuses on South Carolina's landscape legacy of the built environment. *Preq:* Junior standing.
- LARC 4900 Directed Studies and Projects in Landscape Architecture 1-5 (1-5)** Comprehensive studies and/or research of special topics not covered in other landscape architecture courses. May be repeated for a maximum of ten credits. *Preq:* Consent of instructor.
- LARC 4910 Honors Research Methods for Landscape Architecture 1-3 (1-3)** Students investigate various research methodologies in landscape architectural design or related areas and apply to student generated project(s). Students generate a proposal for Landscape Architecture Honors Research. *Preq:* Junior standing and membership in Calhoun Honors College and consent of Department Honors Program Advisor.
- LARC 4930 Professional Office Internship 1-3 (1-3)** Office experience for advanced students. On-the-job learning requires a minimum of five uninterrupted sequential weeks of employment under the direct supervision of a preapproved registered landscape architect, architect, urban planner, or civil engineer. May be repeated for a maximum of six credits. To be taken Pass/Fail only. *Preq:* LARC 3520 and LARC 3620 and consent of instructor.
- LARC 4940 Landscape Architecture Honors Research 2-3 (2-3)** Independent, student-generated research on a preapproved topic conducted under the supervision and weekly guidance of a faculty member. Second in a sequence of three required courses for students enrolled in Departmental Honors Program. Written interim report and presentation to faculty and honors students are required before the end of the semester. May be repeated for a maximum of six credits. *Preq:* LARC 4910 and membership in Calhoun Honors College.
- LARC 4950* Landscape Architecture Honors Thesis 2-3 (2-3)** Continuation of independent research, conducted under the supervision and weekly guidance of a faculty member. Third in a sequence of three required courses for students enrolled in Departmental Honors Program. Written thesis is submitted and presented before the end of the semester to qualify for Departmental Honors. *Preq:* LARC 4940.
- LARC 4990 Creative Inquiry—Landscape Architecture IV 3 (3)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. *Preq:* LARC 3990 and consent of faculty member/mentor.

LATIN

LATN 1010 Elementary Latin 4 (4) Course for beginners designed principally to teach the reading of the language.

LATN 1020 Elementary Latin 4 (4) Continuation of LATN 1010.

LATN 2010 Intermediate Latin 3 (3) Review of the fundamental principles of grammar in conjunction with readings from the Classical period. *Preq:* LATN 1020.

LATN 2020 Intermediate Latin 3 (3) Continuation of LATN 2010 with the introduction of writings from the late Latin and Medieval periods. *Preq:* LATN 2010.

LAW

Associate Professors: F.L. Edwards, M.E. Mowrey;
Lecturers: J.R. Jahn, V.L.S. Ward-Vaughn

LAW 3220 Legal Environment of Business 3 (3) Examination of both state and national regulation of business. Attention is given to the constitution and limitations of power, specific areas in which governments have acted, and the regulations that have been imposed in these areas. Includes Honors sections. *Preq:* Junior standing.

LAW 3330 Real Estate Law 3 (3) The nature of real property and means of acquiring rights therein: conveyance of ownership, creation and execution of deeds, mortgages, etc., landlord and tenant relationships, shared concepts, and government regulation.

LAW 3990 Internship in Legal Studies 1-3 (1-3) Faculty-supervised legal internship to give students learning opportunities that support their classroom experiences. Requires a minimum of six full-time weeks. Course enrollment and internship must occur in the same semester. Simultaneous credit cannot be received for another internship offering. May be repeated for a maximum of three credits. To be taken Pass/No Pass only. *Preq:* Junior standing.

LAW 4050* Construction Law 3 (3) Provides a practical knowledge of legal principles applied to the construction process and legal problems likely to be encountered by practicing construction professionals. Topics include construction contracting, liability, claims and warranties, documentation, and responsibility and authority of contracting parties. *Preq:* LAW 3220 or LAW 3330.

LAW 4060 Sports Law 3 (3) Provides awareness of sport-related legal issues. Topics include contracts, torts, arbitration, mediation, criminal liability, intellectual property, gender equity, disabilities, drug testing, and professional and amateur organizations. *Preq:* LAW 3220 and Senior standing.

LAW 4200* International Business Law 3 (3) Intensive examination of the historical background of modern public and private international law; selected issues of public international law—human rights, law of war, United Nations' system, and international litigation; selected issues of private international—law international sales, international trade, and formation and operation of multinational businesses. *Preq:* LAW 3220.

LAW 4990 Selected Topics 1-3 (1-3) In-depth examination of timely topics in legal studies. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Senior standing and consent of instructor.

LIBRARY

Librarians: L. Bodenheimer, J.G. Comfort, J.E. Cross, P.A. Draper, B.A.W. Helsel, M.F. Kohl, P.G. Munson, L.P. Sill, D.S. Taylor, P.J. Tyler, K.L. Wall, *Dean;* *Associate Librarians:* A.C. Burns, G.M. Cochrane, C.A. Colthorpe, C.C. Cooper, E.J. Holley, *Chair;* S.D. Johnson, D.G. Julian, S.R. Schilf, K.M. Wesley; *Assistant Librarians:* S.M. Dutkiewicz, J.R. Friedman, M.S. Futral, S. George-Williams, R.L. Hollandsworth, S.J. Robichaud, E.J. Rock, G. Teague, R.D. Wilmott

LIB 1990 Creative Inquiry—The Libraries 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

LIB 2990 Creative Inquiry—The Libraries 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

LIB 3010 Introduction to Patent Searching 1 (1)

Introduction to patents with an emphasis on how patents fit into the research process. Students develop skills in creating effective patent search strategies, and evaluating and presenting their search results.

LIB 3990 Creative Inquiry—The Libraries 1-4 (1-4)

In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

LIB 4990 Creative Inquiry—The Libraries 1-4 (1-4)

In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

LANGUAGE AND INTERNATIONAL HEALTH

Associate Professors: D.J. Smith, G.E. Tissera, *Director:* Y. Zhang; *Lecturers:* J.D. Martin-Armas, R. Tremolada

LIH 1270 Introduction to Language and International Health 1 (1)

Survey of international health and related career opportunities, focusing on the two distinct emphasis areas of the major: community development and health administration. To be taken Pass/No Pass only.

LIH 2970 Creative Inquiry—Language and International Health 1-4 (1-4)

In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration.

LIH 3970 Creative Inquiry—Language and International Health 1-4 (1-4)

Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.

LIH 4000 Internship Abroad 3 (3)

One semester, full-time internship in a health care or a health administration setting abroad. To be taken Pass/No Pass only. *Preq:* Second semester Junior standing.

LIH 4970 Creative Inquiry—Language and International Health 1-4 (1-4)

Continuation of research initiated in LIH 3970. Students complete their project and disseminate their research results. *Preq:* LIH 3970.

LANGUAGE AND INTERNATIONAL TRADE

Professor: S. Oropesa, *Chair;* *Associate Professors:* T. Kishimoto, E. Touya, *Interim Director;* *Lecturers:* S. Chen, L. Ferrell, M. Zamora

LIT 1270 Introduction to Language and International Trade 1 (1)

Survey of the nature of international trade and related career opportunities. Information and applications of specific relevance to tourism, agriculture, and textile industries are offered. To be taken Pass/No Pass only.

LIT 2970 Creative Inquiry—Language and International Trade 1-4 (1-4)

In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration. *Preq:* Consent of faculty member.

LIT 3970 Creative Inquiry—Language and International Trade 1-4 (1-4)

Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.

LIT 4000 Language and International Trade Internship 1-3 (1-3)

Mandatory internship with an international company in the U.S. or abroad. May be part-time or full-time during the summer or academic semester for a minimum of 1400 hours. After completing the internship, students register for three credits of LIT 4000 and write a research paper in the target language. To be taken Pass/No Pass only. *Preq:* CHIN 3160 or FR 3160 or GER 3160 or JAP 3160 or SPAN 3160; and twelve credit hours in a Language and International Trade technical option.

LIT 4020 Language and International Trade Directed Study 3 (0)

Directed study of an individual project in language and international trade. To be taken Pass/No Pass only.

LIT 4970 Creative Inquiry—Language and International Trade 1-4 (1-4)

Continuation of research initiated in LIT 3970. Students complete their project and disseminate their research results. *Preq:* LIT 3970.

LEISURE SKILLS

Lecturer: D.M. Anderson

LS 1000 Selected Topics 1 (3)

Presentation of leisure skills not covered in other courses. May be repeated for a maximum of three credits, but only if different topics are covered.

LS 1010 Challenge Recreation Activities 1 (1)

Encourages students to broaden their leisure skills and improve self-image through challenge activities. Classroom instruction stresses how to get started safely in flying, scuba, canoeing, skiing, windsurfing, mountaineering, hang-gliding, ballooning, and other challenge activities.

LS 1110 Lapidary Arts 1 (3)

Students learn the techniques used to transform raw materials such as gemstones, minerals, gold, and silver into objects of art—primarily jewelry.

LS 1130 Wood Carving 1 (3) Introduction to the art of wood carving. Students learn about types of wood, tools, carving, and shop safety.

LS 1250 Budget Travel 1 (3) Teaches the necessary skills to travel internationally on a budget. Students learn how to get the best airfares, research destinations, and build an itinerary. Packing, security, local transportation, and culture/reverse-culture shock are also discussed.

LS 1260 Group Initiatives 1 (2) Students learn to lead people in group initiatives, also called team building exercises, with the goal of developing trust, cooperation, risk-taking, and leadership among participants. Students learn specific initiatives to lead, as well as how to bring groups to their intended goals.

LS 1330 Women's Shotgun Shooting 1 (3) Introduces basic shotgun shooting skills and firearm safety. Topics include gun fitting, skeet and trap shooting, and gun and range safety. Course is designed to provide women a comfortable environment in which to learn the necessary skills to participate in shotgun shooting.

LS 1340 Women's Hunting Traditions 1 (3) Students receive hands-on instruction in shooting sports and the sport of hunting. Students are introduced to the safe and responsible use of firearms and archery, and learn how to participate safely in hunting.

LS 1350 Women's Riflery 1 (3) Introduces students to the basics of rifle shooting and safety. Students learn basic shooting skills and are exposed to more advanced topics, such as reloading, external ballistics and long range shooting. This course is designed to give women a comfortable environment to learn the skills necessary to participate in the sport of riflery.

LS 1410 Top Rope Climbing 1 (3) Basic rock climbing skills, including philosophy, safety, knots, climbing techniques, site and supplies selection, and nature/conservation issues are covered.

LS 1430 Mountain Biking 1 (3) Introduces the sport of mountain biking; guides students on techniques and procedures to plan and undertake rides. Covers both on-trail and off-trail bike mechanics used to keep bikes in proper working order.

LS 1440 Performance Cycling 1 (3) Provides aspiring cyclists with all the information necessary to be safe and successful cyclists. Students learn how to ride safely on open roadways, group riding skills, bike maintenance, and bike mechanics.

LS 1450 Camping and Backpacking 1 (3) Basic camping and backpacking skills including map and compass reading, outdoor cooking, camping hazards and safety, site selections, and trip planning.

LS 1470 Alpine Skiing 1 (3) Basic downhill snow skiing instruction including equipment selection, safety, and maintenance; parallel turns; edging; carved and linked turns; wedeling; and safety and etiquette. There is an additional fee for this course. Taught during Christmas recess. (Contact the Department of Parks, Recreation and Tourism Management in October.)

- LS 1490 Snowboarding 1 (3)** Basic snowboarding instruction including equipment selection; safety; conditioning; and skills such as stopping, techniques for turning, and riding lifts. There is an additional fee for this course. Taught during Christmas recess. (Contact the Department of Parks, Recreation and Tourism Management in October.) May not be taken concurrently with LS 1470 or 3470.
- LS 1560 Riflery 1 (3)** Introduces the basics of rifle shooting and firearm safety. Students progress from beginning rifle shooting to more advanced topics such as reloading, external ballistics, and long-range shooting.
- LS 1570 Shotgun Shooting 1 (3)** Introduces students to basic shotgun shooting skills and firearm safety. Topics include gun fitting, chokes, gauges, ammunition, and different shotgun disciplines such as skeet, trap shooting, and sporting clays.
- LS 1580 Archery 1 (3)** Introduces students to the basic principles and skills of archery and helps them develop proper shooting form and marksmanship.
- LS 1590 Hunting Traditions 1 (3)** Basic, hands-on instruction in the shooting sports (shotgun, rifle, and archery) and the sport of hunting. Designed to introduce students to the safe and responsible use of firearms and archery equipment and safe hunting practices. Students are required to complete the South Carolina Department of Natural Resources Hunter Education certification.
- LS 1610 Turkey Hunting 1 (3)** Exposes students to the skills, techniques, and history of turkey hunting. Students learn gun and hunting safety; shotgun, muzzleloading, and archery hunting techniques; tracking; and basic calling techniques.
- LS 1640 Whitewater Kayaking 1 (3)** Flat-water and whitewater skills, techniques, safety, rescue, equipment selection and maintenance, and selection of routes/trips to participate in basic white-water kayaking. Students must possess basic swimming skills to enroll in this course.
- LS 1650 Inland Kayak Touring 1 (3)** Introduction to basic skills necessary for safe enjoyment of flat-water (non-tidal waters: lakes, slow moving rivers) kayak touring. Students learn equipment selection, strokes, safety, and rescue techniques. Students must demonstrate swimming competence to enroll in this course.
- LS 1670 Canoeing 1 (3)** Basic instruction in the nomenclature, strokes, and safety techniques in canoeing. Students must possess basic swimming skills to enroll in this course.
- LS 1690 Sailing 1 (3)** Basic instruction in the nomenclature, safety and rescue techniques, and skills required to skipper sailing craft. Students must possess basic swimming skills to enroll in this course.
- LS 1710 Windsurfing 1 (3)** Basic windsurfing instruction including rigging, launching, tacking, jibbing, rig and foot steering, safety, maintenance, equipment selection, rules-of-the-road, and racing techniques are covered. Offered Fall Break and first summer session. There is an extra fee for this course. Students must have the ability to swim 3000 yards and tread water for five minutes to enroll in this course.
- LS 1730 Bass Fishing 1 (3)** Provides basic knowledge and skills necessary to participate successfully in bass fishing.
- LS 1750 Fly Fishing 1 (3)** Introductory course in the techniques of fly-fishing. Students learn casting, fly-tying, and equipment selection.
- LS 1760 Beginning Fly Tying 1 (3)** The art of fly tying. Students learn basic fly tying techniques and gain a knowledge of materials and tools used in fly tying.
- LS 1770 Saltwater Fly Tying 1 (3)** Introduction to tying flies for saltwater applications of fly fishing.
- LS 1790 Scuba I 1 (3)** Teaches basic open water diving techniques; prepares students to complete requirements for the open water diving certification. Certifications are granted by an internationally recognized and accepted certifying agency. Students are required to pass a swim test required by certifying agency.
- LS 1830 Introduction to Rugby 1 (3)** Introduces students to the sport of Rugby. Covers history of the game, rules, and skills such as passing, kicking, and decision making.
- LS 1850 Bowling 1 (3)** Basic instructional program on techniques of bowling.
- LS 1870 Frisbee Sports 1 (3)** Focuses on the rules, history, and skills necessary for participating in various frisbee sports. Heavy emphasis is placed on Ultimate Frisbee and Frisbee Golf.
- LS 1880 Disc Golf 1 (3)** Introduces students to basic disc golf skills and knowledge. Topics include development of basic throwing skills, rules of the game, game strategy and disc golf etiquette.
- LS 1890 Tennis 1 (3)** Fundamental course stressing rules, strokes, and strategy, with ample opportunity for practice.
- LS 1940 Racquetball 1 (3)** Basic skills, knowledge of rules, strategy, and basic strokes.
- LS 1950 Intermediate Racquetball 1 (3)** Builds on knowledge gained in LS 1940. Students learn advanced swing mechanics, game strategy, and other advanced skills. *Preq:* LS 1940. Students who have not taken LS 1940 may demonstrate that they possess equivalent skill and obtain a registration override.
- LS 1960 Introduction to Billiards 1 (3)** Introductory course in the history, rules, and skills necessary to participate in billiards. Students learn different types of games, proper shot techniques, and equipment selection.
- LS 1980 Golf 1 (3)** Fundamental course stressing rules, strategy, and basic strokes.
- LS 1990 Intermediate Golf 1 (3)** Builds on the knowledge gained in LS 1980. Students learn to apply rules to common golf situations, improve ball striking, and course management. The skills and strategies taught are designed to improve existing golf scores.
- LS 2000 Traditional Sports 1 (3)** Introductory course in the history, rules, and skills necessary to participate in traditional sports. Students learn about and participate in basketball, volleyball, football, and softball.
- LS 2020 Field Hockey 1 (3)** Introduces the fundamental skills, history, and rules of field hockey.
- LS 2030 Lacrosse 1 (3)** Introduces the fundamental skills, history, and rules of men's and women's lacrosse.
- LS 2040 Soccer 1 (3)** Introduces the history, rules, and fundamental skills of soccer.
- LS 2100 Learn to Dance 1 (2)** Students develop an understanding of the qualities of dance, recognize the importance of dance as a leisure pursuit, and learn to dance to difference types of music. Dances include shag, waltz, cha-cha, foxtrot, as well as current dance trends.
- LS 2110 Introduction to Belly Dance 1 (2)** Introduces students to the Middle Eastern belly dance. In addition to learning choreography and belly dance skills, students are introduced to the traditions and origins of Middle Eastern belly dance.
- LS 2120 Belly Dance II 1 (2)** Designed to build on the dance and musicality skills developed during Introduction to Belly Dance, this course also introduces students to choreography, additional dance styles, improvisation, and the use of finger cymbals when they participate as a member of a percussion section. *Preq:* LS 2110.
- LS 2130 Middle Eastern Dance 1 (2)** Explores the various dance styles associated with middle eastern countries. Students learn dances, rhythms and traditions from Egypt, Libya, Morocco, Saudi Arabia, Lebanon and Turkey.
- LS 2140 Modern Dance 1 (3)** Introduction to modern dance techniques with emphasis on developing the style of movement and understanding the dance art form.
- LS 2160 Contra Dance 1 (2)** Introduces students to the social dance of Contra. Students learn the origin and history of Contra along with the basic dance steps and styles.
- LS 2180 Ballroom Dance 1 (2)** Students develop an understanding of advanced dance methods, learn about dance at social and competitive levels, and increase knowledge of a variety of both smooth and Latin steps. Dances include tango, cha-cha, waltz, foxtrot, and swing.
- LS 2190 Country Western Dance 1 (2)** Introduces traditional country western dance. Students learn traditional couples dances, line dances, and barn dances.
- LS 2200 Shag 1 (2)** Develops an understanding of the South Carolina state dance, its history and impact on the state. Students learn more advanced steps in shag, including bellyroll, sugarfoot, slide step, tiptoe up the ladder, pivot, and the thirteen steps.
- LS 2210 Intermediate Shag Dance 1 (2)** Builds on skills learned in LS 2200. Students improve their ability to improvise, add style, and add many different moves to their dance vocabulary. *Preq:* LS 2200.
- LS 2220 Advanced Shag 1 (2)** Exposes students to a competition level of shag. Students learn to break down a dance routine and to choreograph short routines. *Preq:* LS 2210.
- LS 2270 Introduction to Swing Dance 1 (2)** Introduction to vintage swing dance created in the 1920's-1950's, including Charleston, Lindy Hop, Jitterbug, and optional acrobatic moves used in performance and competition.
- LS 2280 Intermediate Swing Dance 1 (2)** Builds on skills learned in LS 2270 by improving students' ability to improvise, add style, musicality, and many additional moves to add to their dance vocabulary. *Preq:* LS 2270.

LS 2290 Advanced Swing Dance 1 (2) Focuses on competition level and style of swing dance. Students learn to break down and teach a routine to beginners. Students also learn the skills necessary to create and choreograph a short routine. *Prq:* LS 2280.

LS 2310 Bosu 1 (3) Introduces the group aerobic style of Bosu, which concentrates on physical stability, core strength, and general fitness.

LS 2320 Core Stability Training 1 (3) Teaches fundamentals of core training. Students learn basic anatomy, proper strength training, and how to design a program to fit their fitness goals.

LS 2330 Aerobic Dance 1 (3) Instruction in the development of skills for the safe improvement and maintenance of cardiovascular fitness, flexibility, and muscle tone utilizing dance movements and techniques.

LS 2350 Basic Yoga 1 (3) Develops flexibility, strength, sensitivity, energy, and a sense of relaxation through the study of basic yoga postures, conscious breathing, and meditation techniques.

LS 2360 Power/Ashtanga Yoga 1 (3) Power/Ashtanga Yoga is a comprehensive workout based on the Eastern philosophy of K. Pattabhi. Students learn the eight limbs of this philosophy and the rigorous series of postures that produce a high power, athletic workout with the purpose of detoxifying impurities in the body.

LS 2370 Kripalu Yoga 1 (3) Great emphasis is placed on learning breath work techniques to combine directly with the various kripalu yoga postures. The goal is to teach individuals the physiological reactions produced by this type of yoga in developing and restoring health.

LS 2380 Vinyasa Flow Yoga 1 (3) Explores the energetic, fluid movement of Yoga postures in sync with conscious breathing. Students study creative sequences using classical as well as innovative and advanced Yoga postures.

LS 2420 Meditation and Relaxation 1 (2) Exposes students to the benefits of relaxation and meditation techniques. Students learn different techniques used to relieve stress and promote relaxation.

LS 2450 Pilates 1 (3) Study of the history, philosophy, and fundamental movement concepts of Pilates.

LS 2460 Intermediate Pilates 1 (3) Course is designed to expand students' knowledge and practice of the principles, techniques and exercises learned in the basic Pilates course. *Prq:* LS 2450.

LS 2500 Marathon Training 1 (3) Provides students with the resources and knowledge to train for and successfully complete a marathon.

LS 2510 Running and Jogging 1 (3) Introduces the various components important to improving overall fitness level through a running or jogging activity. Topics include proper stretching exercises, nutrition, workout program design, and proper running techniques.

LS 2580 Self Defense 1 (3) Basic physical defense that incorporates risk avoidance and awareness techniques with basic physical defense options.

LS 2640 Aikido 1 (3) Introduces the modern Japanese martial art of Aikido.

LS 2660 Hapkido 1 (3) Introduces the fundamental skills and techniques of the self-defense based Korean martial art of Hapkido.

LS 2700 Sports Officiating 1 (3) Practical study of officiating for various sports. Includes studies and practical application of officiating rules and mechanics. Sports studied include football, basketball, softball, soccer, and introductions to a variety of other team sports.

LS 2750 Red Cross First Aid/CPR 1 (3) Gives students the knowledge and skills necessary to prevent, recognize, and provide basic care for infants, children, and adults with injuries and sudden illness.

LS 2760 First Aid/CPR for the Professional 1 (2) This American Red Cross CPRAED for the Professional Rescuer course teaches those with a duty to act the skills needed to respond appropriately to breathing cardiac emergencies, including the use of an Automated External Defibrillator (AED) to care for a victim of cardiac arrest.

LS 2770 Lifeguarding 1 (3) Students gain the knowledge and skills to prevent, recognize and respond to emergencies and to provide care for injuries and sudden illness. Upon course completion, students receive a lifeguarding certification from the American Red Cross.

LS 2780 Wilderness First Aid 1 (2) This American Red Cross Wilderness First Aid with Adult CPR course provides individuals involved with wilderness activities with the knowledge and skills to prevent, recognize and provide basic care for injuries and sudden illness when more advanced help is not immediately available.

LS 2910 Outdoor Leadership 1 (3) Introduces the skills necessary to lead others in a backcountry environment. Focus is on wilderness travel skills, minimum impact, group dynamics, leadership skills and decision making. Course also includes certification in Wilderness First Aid.

LS 3470 Advanced Alpine Skiing 1 (3) Advanced downhill snow skiing instruction in such techniques as mogul skiing, check turns, free-style, and racing. There is an additional fee for course. Taught over Christmas break. Credit is awarded for spring semester. (Contact Department of Parks, Recreation and Tourism Management in October.) *Prq:* LS 1470.

LS 3560 Riflery II 1 (2) Students build upon skills previously learned in the basic riflery course, and learn advanced skills, such as using ballistic software and chronographs, precision long range shooting and advanced reloading.

LS 3580 Advanced Shotgun Skeet 1 (2) Introduces students who have taken the basic shotgun course to the shotgun game of Skeet. Students learn the rules and techniques necessary to competitively participate in Skeet.

LS 3890 Intermediate Tennis 1 (3) Develops skills necessary to play at a competitive level of tennis. Students learn mechanically sound tennis skills, court positioning, court movement, proper shot selection, and strategic insight into the game. *Prq:* LS 1890.

MATHEMATICAL SCIENCES

Professors: W.P. Adams, J.R. Brannan, W.C. Bridges, Jr., N.J. Calkin, C.L. Cox, V.J. Ervin, X. Gao, P.D. Gerard, H.S. Hill, Jr., P.C. Kiessler, K.B. Kulasekera, R.B. Lund, G.L. Matthews, W.F. Moss III, J.R. Rieck, D.R. Shier, R.L. Taylor, *Chair:* D.D. Warner, M.M. Wiecek; *Associate Professors:* J. Brown, E.S. Dimitrova, C.M. Gallagher, W. Goddard, J.A. Hoffacker, K.L. James, E.W. Jenkins, T.R. Khan, H.K. Lee, H. Maharaaj, C. Park, J.K. Peterson, L. Rebholz, M.J. Saltzman, X. Sun, C.L. Williams; *Assistant Professors:* P. Belotti, J. Dogbey, B.H. Fralix, Z.S. Hazari, J. Luo, M. Macaulay, C.S. McMahan, M. Mitkovski, G.D. Potvin, S. Poznanovikj, M.J. Schmoll, J.L. Sharp, A. Tyminski, H. Xue, J.R. Yoon; *Senior Lecturers:* S.S. Biggers, M.E. Cawood, J.E. Cottingham, T.A. Johnson, R.M. Martinez-Dawson, J.I. McKnew, B.A. Novick, S.A. Prevost, M.A. Reba, D.M. Simms, I.V. Viktorova; *Lecturers:* N. Bannister-Sinwell, E.H. Breazel, R.E. Davidson, C.A. Davis, R.S. Dubsy, E. Gallagher, A.A. Guest, J.M. Hanna, M.L. Hanna, Jr., N. Hubing, J.B. Lassiter, D.A. Moss, J. R. Newton, T.F. Parrott, M. Rios-Adams, L.J. Shick, A.K. Stoddard, T.C. Teitloff, J. Van Dyken, S.E. Walker; *Visiting Professor:* J.D. Fulton; *Visiting Assistant Professor:* N.L. Chenette; *Visiting Lecturers:* N. Hubing, A. Keaton, P.P. King

MATH 1010 Essential Mathematics for the Informed Society 3 (3) Topics include logic and computers, probability and statistics, and financial mathematics. Specific topics include Boolean algebra, digital data formats, randomness, graphical representation of data, inference and estimation; interest, annuities, and amortization. Not open to students who have received credit for MATH 3010, 3020, 3090, or STAT 3010. *Prq:* Any MATH or STAT course or a score of 50 or higher on the Clemson Mathematics Placement Test.

MATH 1020 Introduction to Mathematical Analysis 3 (3) Intuitive approach to the concepts and applications of calculus. Topics include functions and graphing, differentiation, and integration. Applications from social, biological, and management sciences are presented. Not open to students who have received credit for MATH 1060. *Prq:* Any MATH or STAT course or a score of 60 or higher on the Clemson Mathematics Placement Test.

MATH 1030 Elementary Functions 3 (2) Gateway course for MATH 1060. Comprehensive treatment of functions and analytic geometry with applications including polynomial, rational, algebraic, exponential, logarithmic, and trigonometric functions. Not open to students who have received credit for MATHS 105. To be taken Pass/No Pass only. *Prq:* Any MATH or STAT course or a score of 65 or higher on the Clemson Mathematics Placement Test. *Coreq:* MATH 1031.

MATH 1031 Elementary Functions Laboratory 0 (2) Non-credit laboratory to accompany MATH 1030. *Coreq:* MATH 1030.

- MATH 1040 Precalculus and Introductory Differential Calculus 4 (4)** Relevant precalculus and algebra review, limits, continuity and introduction to differential calculus. The combination of MATH 1040 and MATH 1070 covers the same calculus material as MATH 1060. MATH 1040 alone cannot be substituted for any calculus course. To be taken Pass/No Pass only. Not open to students who have received credit for MATH 1060. *Preq:* Any MATH or STAT course or a score of 65 or higher on Clemson Mathematics Placement Test.
- MATH 1050 Precalculus 5 (4)** Extensive treatment of topics chosen to prepare students for the study of calculus. Special emphasis is given to polynomial, rational, exponential, logarithmic, and trigonometric functions and their graphs, as well as basic and analytic trigonometry. Students who have received credit for any other mathematical sciences course will not be allowed to enroll in or receive credit for MATH 1050. To be taken Pass/No Pass only. *Coreq:* MATH 1051.
- MATH 1051 Precalculus Laboratory 0 (2)** Non-credit laboratory to accompany MATH 1050. *Coreq:* MATH 1050.
- MATH 1060 Calculus of One Variable I 4 (4)** Topics include analytic geometry, introduction to derivatives, computation and application of derivatives, integrals, exponential and logarithm functions. Includes Honors sections. *Preq:* MATH 1030 or MATH 1040 or MATH 1050 or a score of 80 or better on the Clemson Mathematics Placement Test.
- MATH 1070 Differential and Integral Calculus 4 (4)** Continuation of MATH 1040. Successful completion of MATH 1040 and MATH 1070 is equivalent to the completion of MATH 1060. Continuation of differential calculus and an introduction to integral calculus. Not open to students who have received credit for MATH 1060. *Preq:* MATH 1040.
- MATH 1080 Calculus of One Variable II 4 (4)** Topics include transcendental functions, applications of integration, integration techniques, indeterminate forms, improper integrals, parametric equations, polar coordinates, and infinite series. Includes Honors sections. *Preq:* MATH 1060 or MATH 1070.
- MATH 1110 Calculus II for Biologists 4 (4)** Selected topics from integral calculus, eigenvalues and eigenvectors of matrices and differential equations are used to encourage the use of mathematics, computational tool and biological science in the study of relevant biological models. Credit toward a degree will be given for only one of MATH 1080 and MATH 1110. *Preq:* MATH 1060 or MATH 1070.
- MATH 1150 Contemporary Mathematics for Elementary School Teachers I 3 (3)** Cooperative learning groups, manipulatives, and concrete models are used to demonstrate logical reasoning, problem-solving strategies, sets and their operations, numeration systems, properties and operations of whole numbers, number theory, prime and composite numbers, divisibility, common factors and multiples. Open to Elementary, Early Childhood, and Special Education majors only. *Preq:* Any MATH or STAT course or a score of 50 or higher on the Clemson Mathematics Placement Test.
- MATH 1160 Contemporary Mathematics for Elementary School Teachers II 3 (3)** Continuation of MATH 1150. Manipulatives and concrete models are used for properties, operations, and problem solving for integers, elementary fractions, rational numbers, and real numbers. Selected topics in statistics and probability are introduced with a hands-on approach to learning. Restricted to Elementary, Early Childhood, and Special Education majors. *Preq:* MATH 1150.
- MATH 1170 Mathematics for Elementary School Teachers I 3 (2)** Problem-solving strategies, logic, algebraic thinking, sets, relations, functions, numeration systems, whole numbers, integers, number theory, fractions, decimals, applications of percent, real numbers with their computational algorithms and properties are explored. Content, according to state standards, is taught with appropriate methodology for teaching K-6. *Preq:* MATH 1010. *Coreq:* MATH 1171.
- MATH 1171 Mathematics for Elementary School Teachers I Laboratory 0 (2)** Non-credit laboratory to accompany MATH 1170. *Coreq:* MATH 1170.
- MATH 1180 Mathematics for Elementary School Teachers II 3 (2)** Simple probability and descriptive statistics are reviewed. Two- and three-dimensional geometry including polygons, polyhedra and their properties; congruence, similarity, and constructions; coordinate system; standard measurement, area, surface area, volume; and motion geometry are explored. Content, according to State standards, is taught with appropriate methodology for teaching K-6. *Preq:* MATH 1170. *Coreq:* MATH 1181.
- MATH 1181 Mathematics for Elementary School Teachers II Laboratory 0 (2)** Non-credit laboratory to accompany MATH 1180. *Coreq:* MATH 1180.
- MATH 1190 Introduction to Discrete Methods 3 (3)** Topics normally include elementary logic and methods of proof; sets, functions, and relations; graphs and trees; combinatorial circuits and Boolean algebra.
- MATH 1290 Problem Solving in Discrete Mathematics 3 (2)** Problem-solving approach to learning mathematics is applied to topics in modern discrete mathematics. Typical selection of topics includes logic and proof, sets, relations, functions, mathematical induction, graphs and trees, counting techniques, recurrence equations. For Bachelor of Science and Bachelor of Arts majors in Mathematical Sciences only. Credit may not be received for both MATH 1190 and MATH 1290. *Preq:* MATH 1060 or MATH 1070. *Coreq:* MATH 1291.
- MATH 1291 Problem Solving in Discrete Mathematics Laboratory 0 (2)** Non-credit laboratory to accompany MATH 1290. *Coreq:* MATH 1290.
- MATH 1990 Problem Solving in Mathematics 3 (2)** Functions and graphs, mathematical modeling, and applications. Applications from management and life and social sciences are presented. Specific topics include linear, quadratic, polynomial, exponential, and logarithmic functions with emphasis on problem solving. Students who have received credit for any other mathematical sciences course will not be allowed to enroll in or receive credit for MATH 1990. To be taken Pass/No Pass only. *Coreq:* MATH 1991.
- MATH 1991 Problem Solving in Mathematics Laboratory 0 (2)** Non-credit laboratory to accompany MATH 1990. *Coreq:* MATH 1990.
- MATH 2060 Calculus of Several Variables 4 (4)** Topics include real valued functions of several variables, multiple integration, differential calculus of functions of several variables, vector field theory. Includes Honors sections. *Preq:* MATH 1080 or MATH 1110.
- MATH 2070 Multivariable Calculus 3 (3)** Introduction to the calculus of several variables, differential calculus and optimization of several variables, multiple integrals. Topics from the management sciences are used to illustrate the above concepts. May not be taken by students who have passed MATH 2060. *Preq:* MATH 1020 or MATH 1060 or MATH 1070.
- MATH 2080 Introduction to Ordinary Differential Equations 4 (4)** Introduction to the study of differential equations and their application to physical problems. Topics include exact, series, and numerical solutions; solutions by means of Laplace transforms; and solutions of systems of differential equations. Includes Honors sections. *Preq:* MATH 2060.
- MATH 2100 Applied Matrix Algebra 3 (3)** Introduction to the basic principles of matrix algebra with applications to the behavioral and managerial sciences. Major areas of application include linear programming, directed graphs, and game theory. *Preq:* MATH 1020 or MATH 1060 or MATH 1070.
- MATH 2160 Geometry for Elementary School Teachers 3 (3)** Informal treatment of the basic concepts of geometry. Open to Elementary, Early Childhood, and Special Education majors only. *Preq:* MATH 1160.
- MATH 2500 Introduction to Mathematical Sciences 1 (1)** Introduction to areas of study, degree options, career choices, and professional development in mathematical sciences. Includes guidelines and requirements for portfolio development and an introduction to ethical issues.
- MATH 2990 Creative Inquiry-Mathematical Sciences 1-3 (1-3)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of three credits. *Preq:* Consent of faculty member/mentor.
- MATH 3020 Statistics for Science and Engineering 3 (3)** Calculus based statistics course in methodology for collecting, organizing, and interpreting data. Topics include understanding variability, graphical and numerical summarization of data, introductory probability, normal and related distributions, statistical inference, basic experimental design, and simple linear regression. Statistical software is used. *Preq:* MATH 2060.
- MATH 3080 College Geometry 3 (3)** Theorems and concepts more advanced than those of high school geometry. Treatment of the various properties of the triangle, including the notable points, lines, and circles associated with it. *Preq:* MATH 1060 or MATH 1070.

- MATH 3110 Linear Algebra 3 (3)** Introduction to the algebra of matrices, vector spaces, polynomials, and linear transformations. Includes Honors sections. *Preq:* MATH 1080 or MATH 1110.
- MATH 3150 Advanced Topics in Mathematics for Elementary Teachers 3 (3)** Course builds and expands upon content from previous elementary mathematics courses. Covers investigation of two- and three-dimensional shapes; scale and scale factor; ratio and proportional reasoning; relationships between perimeter, area, surface area and volume; relationships between fractions, decimals, and percents. Open to Elementary, Early Childhood, and Special Education majors only. *Preq:* MATH 2160.
- MATH 3160 Problem Solving for Mathematics Teachers 3 (3)** Course emphasizes problem solving and builds and expands upon previous mathematics content courses by examining connections between number and operations; algebra; data analysis and probability; geometry; and measurement. Open to Elementary, Early Childhood, and Special Education majors only. *Preq:* MATH 2160.
- MATH 3190 Introduction to Proof 3 (3)** Introduces mathematical proofs with topics that include proof techniques, elementary logic, induction, sets, functions, and relations. *Preq:* MATH 1080 or MATH 1110.
- MATH 3600 Intermediate Mathematics Computing 3 (3)** Intermediate-level introduction in using computers to solve problems in the mathematical sciences. Fundamental concepts of procedural programming including flow control, modular construction, primitive data structures, recursion, and graphics are applied to problems in applied mathematics, probability, statistics, discrete mathematics, and operations research. *Preq:* MATH 1080 or MATH 1110.
- MATH 3650 Numerical Methods for Engineers 3 (3)** Application of undergraduate mathematics and basic engineering principles with emphasis on numerical methods, computer programming and the use of mathematical software packages in the solution of engineering problems. *Preq:* ENGR 1090 and MATH 2080, each with a C or better.
- MATH 3820 Honors Seminar I (1)** Weekly seminar to prepare students in Departmental Honors Program for independent senior research. At the end of the second semester, each student must have identified a research topic and a faculty advisor. May be repeated for a maximum of two credits. *Preq:* Junior standing in departmental honors program.
- MATH 3990 Creative Inquiry—Mathematical Sciences I-3 (1-3)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of three credits. *Preq:* Consent of faculty member/mentor.
- MATH 4000* Theory of Probability 3 (3)** Principal topics include combinatorial theory, probability axioms, random variables, expected values; special discrete and continuous distributions, jointly distributed random variables, correlation, conditional expectation, law of large numbers, central limit theorem. Includes Honors sections. *Preq:* MATH 2060.
- MATH 4020* Statistics for Science and Engineering II 3 (3)** Principal topics include simple linear regression, multiple regression and correlation analysis, one-way analysis of variance, multiple comparison, multifactor analysis of variance, experimental design. Computation and interpretation of results are facilitated through use of statistical computer packages. *Preq:* MATH 3020.
- MATH 4030* Introduction to Statistical Theory 3 (3)** Principal topics include sampling distributions, point and interval estimation, maximum likelihood estimators, method of moments, least squares estimators, tests of hypotheses, likelihood ratio methods, regression and correlation analysis, introduction to analysis of variance. Includes Honors sections. *Preq:* MATH 4000.
- MATH 4060* Sampling Theory and Methods 3 (3)** Probability-based treatment of sampling methodology. Theory and application of estimation techniques are treated using simple and stratified random sampling, cluster sampling, and systematic sampling. *Preq:* MATH 4000; and one of MATH 3020 or STAT 2300 or STAT 3090.
- MATH 4070* Regression and Time-Series Analysis 3 (3)** Theory and application of the regression and time series. Approaches to empirical model building and data analysis are treated. Computation and interpretation of results are facilitated through the use of interactive statistical packages. *Preq:* MATH 3110 and MATH 4000; and one of MATH 3020 or STAT 2300 or STAT 3090.
- MATH 4080* Exploration and Analysis of Secondary Mathematics 3 (3)** In-depth exploration and analysis of important underlying ideas in the secondary mathematics curriculum. An emphasis is placed on reasoning and proof as students investigate topics in algebra, geometry, probability, statistics and calculus. *Preq:* MATH 2060.
- MATH 4100 Number Theory 3 (3)** Introduction to theory of integers and related number systems. Topics include historical development, principle of mathematical induction, divisibility, primes, congruences, number-theoretic functions, primitive roots, quadratic residues, and diophantine equations. *Preq:* MATH 1080 or MATH 1110.
- MATH 4110* Introduction to Combinatorics 3 (3)** Introductory course in combinatorial analysis. Topics include enumeration, graph theory, posets, and extremal combinatorics. *Preq:* MATH 3110; and either MATH 1190 or MATH 3190.
- MATH 4120* Algebra I 3 (3)** Provides a first introduction to algebra with topics including modular arithmetic, ring theory and group theory. *Preq:* MATH 3110 and MATH 3190.
- MATH 4130* Algebra II 3 (3)** A continuation of MATH 4120. Topics may include advanced group theory (including Sylow theorems, some classifications of groups); advanced ring theory; field theory; and Galois theory. *Preq:* MATH 4120.
- MATH 4190* Discrete Mathematical Structures I 3 (3)** Applies theoretical concepts of sets, functions, binary relations, graphs, Boolean algebras, propositional logic, semigroups, groups, homomorphisms, and permutation groups to computer characteristics and design, words over a finite alphabet and concatenation, binary group codes, and other communication or computer problems. Includes Honors sections. *Preq:* MATH 3110.
- MATH 4300 Actuarial Science Seminar I 1 (1)** Problem-solving seminar to prepare students for the Society of Actuaries' Exam P or the Casualty Actuarial Society's Exam I (Probability). *Preq:* MATH 4000.
- MATH 4310 Theory of Interest 3 (3)** Comprehensive treatment of the theory of interest including from a calculus-based continuous viewpoint. Topics include simple and compound interest and discount, nominal and effective rates, force of interest, basic and general annuities, yield rates, amortization and sinking funds, and applications to bonds, mortgages, and other securities. *Preq:* MATH 2060.
- MATH 4320 Actuarial Science Seminar II 1 (1)** Problem-solving seminar to prepare students for the Society of Actuaries' Exam FM or the Casualty Actuarial Society's Exam 2 (Financial Mathematics). *Preq:* MATH 4310.
- MATH 4340* Advanced Engineering Mathematics 3 (3)** Fourier series, Laplace and Fourier transform, and numerical methods for solving initial value and boundary-value problems in partial differential equations are developed. Applications to diffusion wave and Dirichlet problems are given. Matrix methods and special functions are utilized. *Preq:* MATH 2080.
- MATH 4350* Complex Variables 3 (3)** Elementary functions; differentiation and integration of analytic functions; Taylor and Laurent series; contour integration and residue theory; conformal mapping; Schwartz-Christoffel transformation. Includes Honors sections. *Preq:* MATH 2060.
- MATH 4400* Linear Programming 3 (3)** Introduction to linear programming covering the simplex algorithm, duality, sensitivity analysis, network models, formulation of models, and the use of simplex codes to solve, interpret, and analyze problems. Includes Honors sections. *Preq:* MATH 2060 and MATH 3110.
- MATH 4410* Introduction to Stochastic Models 3 (3)** Introductory treatment of stochastic processes, finite-state Markov chains, queueing, dynamic programming, Markov decision processes, reliability, decision analysis, and simulation. Both theory and applications are stressed. Includes Honors sections. *Preq:* MATH 4000.
- MATH 4420* Advanced Mathematical Programming 3 (3)** Theory, methodology, and applications of integer and nonlinear programming. Topics include model development, computer solutions, branch and bound, unconstrained and constrained optimization algorithms, complexity and convergence analysis. Case studies are included. *Preq:* MATH 4400.
- MATH 4500 Introduction to Mathematical Models 3 (3)** Includes a study of the modeling process and examples of existing models chosen from physical, biological, social, and management sciences, depending on the instructor. Written and oral report is required for at least one of the models studied. May be repeated for a maximum of six credits. *Preq:* MATH 3600 or MATH 3650; and one of MATH 3020 or STAT 2300 or STAT 3090.
- MATH 4530* Advanced Calculus I 3 (3)** Basic properties of the real number system, sequences and limits, continuous functions, uniform continuity, and differentiation. Includes Honors sections. *Preq:* MATH 2060 and MATH 3190.

MATH 4540* Advanced Calculus II 3 (3)

Continuation of MATH 4530. Material includes Riemann integrals and improper integrals, infinite series, sequences and series of functions. Includes Honors sections. *Preq:* MATH 4530.

MATH 4550* Topics in Geometry 3 (3)

Covers a variety of geometries, such as Euclidean, hyperbolic, projective, and spherical. The intrinsic properties of these spaces, such as their geodesics and isometries, are studied. Other topics include differential geometry of curves and surfaces, Gaussian curvature, and the celebrated Gauss-Bonnet theory linking geometry with topology. *Preq:* MATH 2060 and MATH 3110; and either MATH 1190 or MATH 3190.

MATH 4560* Topology 3 (3)

Introduction to point-set topology. Topics include metric spaces, topological spaces, Hausdorff spaces, homeomorphisms, continuity, product and quotient spaces, compactness, and connectedness. Additional topics, such as homotopy equivalence of paths, the fundamental group, and basic knot theory, are introduced as time permits. *Preq:* MATH 1190 or MATH 3190.

MATH 4600* Introduction to Numerical Analysis I 3 (3)

Introduction to the problems of numerical analysis emphasizing computational procedures and application. Topics include sources of error and conditioning, matrix methods, systems of linear equations, nonlinear equations, interpolation and approximation by splines, polynomials, and trigonometric functions. *Preq:* MATH 2060 or MATH 2070; and MATH 3600 or MATH 3650.

MATH 4630* Mathematical Analysis I 3 (3)

Basic properties of the real number system, sequences and limits; continuous functions, uniform continuity and convergence. Integration, differentiation, functions of several real variables, implicit function theory. Includes Honors sections. *Preq:* MATH 2060.

MATH 4810 Seminar in Mathematics 1-3 (1-3)

Attention is focused on mathematical areas in which nonroutine problems can be posed with comparative ease. Emphasis is on independent study and student use of previously acquired mathematical skills. Open to students by invitation only for a maximum of three credits. *Preq:* Consent of instructor.

MATH 4820 Undergraduate Research 3 (3)

Independent research conducted under the supervision and guidance of a faculty member. May be repeated for a maximum of six credits. Includes Honors sections.

MATH 4910 Independent Study 3 (3)

Independent study or internship in mathematical sciences under faculty supervision. A written report and oral poster presentation of the results of the independent study or internship are required. May be repeated for a maximum of six credits.

MATH 4920 Professional Development 1 (1)

Issues in professional development in the Mathematical Sciences. Individual portfolios are evaluated and critiqued for continued career use. To be taken Pass/No Pass only.

MATH 4990 Creative Inquiry—Mathematical Sciences 1-3 (1-3)

In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of three credits. *Preq:* Consent of faculty member/mentor.

MECHANICAL ENGINEERING

Professors: D.E. Beasley, S.B. Biggers, G.M. Fadel, R.S. Figliola, M. Grujicic, P.F. Joseph, J.M. Ochterbeck, M. Ramasubramanian, *Chair;* J.R. Saylor, J.D. Summers, C. Tong, J.R. Wagner, D.A. Zumbrennen; *Associate Professors:* M. Daqaq, G. Li, R.S. Miller, G. Mocko, R. Qiao, L.L. Thompson, A. Vahidi; *Assistant Professors:* I. Battiato, H. Choi, R. Martinez-Duarte, P. Tallapragada, Y. Wang, X. Xuan, H. Zhao; *Senior Lecturer:* J.M. Delhaye; *Lecturers:* N. Coutris, K. Katuri, P. Meyer, T. Schweisinger, A. Som, D. Willoughby.

ME 2000 Sophomore Seminar 1 (1) Seminars address the Mechanical Engineering program, the profession, best student practices, and career paths. Invited presenters and faculty provide lectures and demonstrations. *Preq or concurrent enrollment:* ME 2010 with a C or better.

ME 2010 Statics and Dynamics for Mechanical Engineers 5 (3)

Vector analysis of the effects of forces, couples, and force-systems on rigid bodies. Conditions of static equilibrium for simple structures, including pulleys, trusses, beams, frames. Kinematics and kinetics of general rigid body motion in 2-D. Applications of Newton's laws, energy methods, and impulse momentum methods to simple machine elements. *Preq:* MATH 1060 or MATH 1070, with a C or better; and MATH 1080 and PHYS 1220, each with a C or better; and both ENGR 1070 and ENGR 1080, or ENGR 1410 with a C or better. *Preq or concurrent enrollment:* ENGR 1090 and ENGR 2080 and PHYS 1240 and MATH 2060, each with a C or better. *Coreq:* ME 2011.

ME 2011 Statics and Dynamics for Mechanical Engineers Laboratory 0 (4) Non-credit laboratory to accompany ME 2010. *Coreq:* ME 2010.

ME 2030 Foundations of Thermal and Fluid Systems 3 (3)

Introduction to control volumes, conservation laws of mass, momentum, and energy. Concepts of work and heat are introduced, including rate forms. Properties of pure substances. *Preq:* MATH 2060 and PHYS 2210, each with a C or better. *Preq or concurrent enrollment:* ME 2220 with a C or better.

ME 2040 Mechanics of Materials 3 (3)

Relationships between external loads on solid bodies or members and the resulting internal effects and dimension changes, including the derivation of rational formulas for stresses and deformations and the identification and use of important mechanical properties of engineering materials. Includes Honors sections. *Preq:* MATH 2060 and ME 2010, each with a C or better. *Preq or concurrent enrollment:* MATH 2080 and ME 2220 and MSE 2100, each with a C or better.

ME 2220 Mechanical Engineering Laboratory I 2 (6)

Discovery of mechanical engineering principles and phenomena. Introduction to laboratory safety practices, instrumentation, calibration techniques, data analysis, and report writing. Introduction to basic manufacturing processes. *Preq:* PHYS 1220 and PHYS 1240 and MATH 1080, each with a C or better.

ME 2900 Creative Inquiry in Mechanical Engineering I 1-3 (1-3)

Students work in extended teams (including sophomores, juniors, seniors, and graduate students) addressing research and development problems under the supervision of a faculty lead. Engineering principles and best practices will be employed. Team work, professionalism, and communication skills are emphasized. May be repeated for a maximum of nine credits. *Preq:* consent of instructor.

ME 3000 Junior Honors Seminar 0 (0)

Acquaints students enrolled in Departmental Honors Program with current research activities in the Department of Mechanical Engineering. Faculty provide seminars in which research interests are summarized. These seminars are planned to prepare students in choosing a research topic for the senior thesis. *Preq:* Junior standing in departmental honors program.

ME 3030 Thermodynamics 3 (3)

Study of the second law and entropy. Includes applications to fixed mass systems and control volumes; vapor and gas power cycles; mixtures of gases; vapor psychrometrics; combustion and the third law. Thermochemical equilibrium. *Preq:* ME 2030 with a C or better.

ME 3040 Heat Transfer 3 (3)

Study of steady and transient heat conduction, free and forced convection, radiation, and multi-mode heat transfer. Emphasizes analytical and numerical solutions to engineering heat transfer problems with a design orientation. *Preq:* MATH 2080 and ME 3080 each with a C or better. *Preq or concurrent enrollment:* MATH 3650 with a C or better.

ME 3050 Modeling and Analysis of Dynamic Systems 3 (3)

Presents techniques for developing and analyzing models of mechanical, electrical, electromechanical, fluid and thermal systems. Transient, steady-state and frequency response are determined using analytical and numerical methods. Covers tools for stability analysis and state-space representation. Covers linear free- and forced-vibrations in single- and multi-degree-of-freedom systems with lumped-parameters representation, methods of vibration absorption and isolations. *Preq:* ECE 2070 and ECE 2080 and MATH 2080 and MATH 3650, each with a C or better. *Preq or concurrent enrollment:* ME 3070 with a C or better.

ME 3060 Fundamentals of Machine Design 3 (3)

Introduction to failure theory and fatigue analysis. Integration of these topics with selected portions of mechanics of materials and application of them to the design and analysis of machine elements. *Preq:* ME 2040 and ME 3070, each with a C or better. *Preq or concurrent enrollment:* MATH 3650, with a C or better.

ME 3070 Foundations of Mechanical Systems 3 (3)

Introduction to physical elements and mechanisms that define basic mechanical engineering systems. Application of kinematic and kinetic analysis to mechanisms and the role of design in mechanisms. *Preq:* ME 2010 with a C or better. *Preq or concurrent enrollment:* ME 2040 with a C or better.

- ME 3080 Fluid Mechanics 3 (3)** Behavior of fluids at rest or in motion, including the study of fluid properties. Emphasizes a rational, analytical approach from which are developed basic principles of broad applicability to all fields of engineering. Includes Honors sections. *Preq:* ME 2010 and ME 2030, each with a C or better. *Preq or concurrent enrollment:* MATH 2080 with a C or better.
- ME 3100 Thermodynamics and Heat Transfer 3 (3)** Introduction to thermodynamics and heat transfer for nonmajors: properties of liquids and gases, first and second law analysis, introduction to cycles for power and refrigeration, heat flow by conduction and radiation, and convective heat flow and heat exchangers. *Preq:* MATH 2060 and PHYS 2210, each with a C or better, and enrollment in an engineering curriculum other than Mechanical Engineering.
- ME 3120 Manufacturing Processes and Their Application 3 (3)** Fundamental principles associated with production processes and their application to the manufacture of products from metals, polymers, ceramics, and composites. Emphasizes the physical and quantitative aspects of processing, the selection of processes to create products, and the identification processes used to manufacture existing products. *Preq or concurrent enrollment:* ME 3040 and ME 3060 and ME 3330, each with a C or better.
- ME 3330 Mechanical Engineering Laboratory II 2 (6)** Mechanical engineering principles and phenomena are reinforced through student conducted experiments. Presentation of fundamentals of instrumentation, calibration techniques, data analysis, and report writing in the context of laboratory experiments. *Preq:* MATH 2080 and ME 2030 and ME 2220, each with a C or better.
- ME 3900 Creative Inquiry in Mechanical Engineering II 1-3 (1-3)** Students work in extended teams (including sophomores, juniors, seniors, and graduate students) addressing research and development problems under the supervision of a faculty lead. Engineering principles and best practices will be employed. Team work, professionalism, and communication skills are emphasized. May be repeated for a maximum of nine credits. *Preq:* Consent of instructor.
- ME 4000 Senior Seminar 1 (1)** Seminars address the problems encountered by engineering graduates in professional practice. Invited lecturers as well as faculty provide the lectures and demonstrations. *Preq or concurrent enrollment:* ME 4010 with a C or better.
- ME 4010 Mechanical Engineering Design 3 (3)** Project-oriented course in mechanical engineering emphasizing the role of analysis, synthesis, and evaluation in design and on written reporting of design solutions. Influence of economics and optimization, concurrent development, integration of design and manufacturing, and system creation are utilized for engineering design decisions. *Preq:* ENGL 3140 and ME 3030 and ME 3040 and ME 3050 and ME 3060, each with a C or better (concurrent enrollment in one of the preceding ME courses is permitted, but student must request a prerequisite override from the undergraduate coordinator). *Preq or concurrent enrollment:* ME 3120 with a C or better.
- ME 4020 Internship in Engineering Design 3 (1)** Creative application of general engineering knowledge in solving an open-ended design problem provided by a sponsor typically external to the University. Progress is evaluated by a faculty jury. Students present results to the jury and sponsor through written reports and oral presentations addressing University written/oral competency goals. Students must have completed all required 3000-level ME courses before enrolling in this course. *Preq:* ME 4010 with a C or better. *Coreq:* ME 4021.
- ME 4021 Internship in Engineering Design Laboratory 0 (3)** Non-credit laboratory to accompany ME 4020. *Coreq:* ME 4020.
- ME 4030 Control and Integration of Multidomain Dynamic Systems 3 (3)** Introduction of control theory with sensor, actuator, and dynamic plant integration to develop, model, control, and analyze mathematical models of dynamics systems, including mechanical, electrical, electromechanical, hydraulic and pneumatic systems. Transient dynamics are determined using analytical and numerical methods with feedback control systems. Strong emphasis is placed on system design using computer simulation tools. *Preq:* ME 3050 with a C or better.
- ME 4150 Undergraduate Research 1-3 (1-3)** Individual research projects conducted under the direct supervision and guidance of a faculty member. May be repeated for a maximum of six credits. Includes Honors sections. *Preq:* Consent of instructor.
- ME 4170* Mechatronics System Design 3 (2)** Mechatronics integrates control, sensors, actuators, and computers to create a variety of electromechanical products. Includes concepts of design, appropriate dynamic system modeling, analysis, sensors, actuating devices, and real time microprocessor interfacing and control. Laboratory experiments, simulation, and design projects are used to exemplify the course concepts. *Preq:* ME 3050 with a C or better. *Coreq:* ME 4171.
- ME 4171 Mechatronics System Design Laboratory 0 (3)** Non-credit laboratory to accompany ME 4170. *Coreq:* ME 4170.
- ME 4180 Finite Element Analysis in Mechanical Engineering Design 3 (2)** Introduction to the finite element method and solid modeling, finite element modeling and analysis using commercial codes; analysis strategies using finite elements; applications to heat transfer, fluid flow, and structures. *Preq:* ME 2040 and ME 3040 and ME 3080, each with a C or better. *Coreq:* ME 4181.
- ME 4181 Finite Element Analysis in Mechanical Engineering Design Laboratory 0 (1)** Non-credit laboratory to accompany ME 4180. *Coreq:* ME 4180.
- ME 4200* Energy Sources and Their Utilization 3 (3)** Covers availability and use of energy sources such as fossil fuels, solar (direct and indirect), and nuclear; addresses energy density and constraints to use (technical and economic) for each source. *Preq:* ME 3030 and ME 3040, each with a C or better.
- ME 4210* Introduction to Compressible Flow 3 (3)** Introductory concepts to compressible flow; methods of treating one-dimensional gas dynamics including flow in nozzles and diffusers, normal shocks, moving and oblique shocks, Prandtl-Meyer Flow, Fanno Flow, Rayleigh Flow, and reaction propulsion systems. *Preq:* ME 3030 and ME 3080, each with a C or better.
- ME 4220* Design of Gas Turbines 3 (3)** Guiding principles in gas turbine cycles are reviewed. Turbine and compressor design procedures and performance prediction for both axial and radial flow machines are presented. Methods of design of rotary heat-exchangers and retrofitting gas turbine for regenerative operation are presented. Design projects are used to illustrate the procedures. *Preq:* ME 3080 with a C or better.
- ME 4230* Introduction to Aerodynamics 3 (3)** Basic theories of aerodynamics are presented for the purpose of accurately predicting the aerodynamic forces and moments which act on a vehicle in flight. *Preq:* ME 3080 with a C or better.
- ME 4250 Aircraft Conceptual Design 3 (3)** This course develops the aspects involved in the conceptual design of an aircraft. Focus is on the interplay between goals and constraints in the process of the design of a subsonic aircraft. *Preq:* ME 3080.
- ME 4260* Nuclear Energy 3 (3)** Engineering methods and science principles are considered for the design of components to nuclear power stations. A systems level understanding is emphasized. Includes nuclear fuel cycle and regulatory considerations. *Preq:* CE 3410; or CHE 3210; or EES 3100; or both ME 3030 and ME 3040; or ME 3100; or MSE 3270; or PHYS 3220; each with a C or better.
- ME 4280 Thermal-Hydraulics of Nuclear Reactors 3 (3)** Provides the mechanical engineer with the basic concepts required to understand the thermal-hydraulic behavior of nuclear reactors in normal operating conditions. *Preq:* ME 3040 with a C or better.
- ME 4290* Thermal Environmental Control 3 (3)** Mechanical vapor compression refrigeration cycles, refrigerants, thermoelectrical cooling systems, cryogenics, thermodynamic properties of air, psychometric charts, heating and cooling coils, solar radiation, heating and cooling loads, insulation systems. *Preq:* ME 3030 and ME 3080, each with a C or better.
- ME 4300* Mechanics of Composite Materials 3 (3)** Develops fundamental relationships for predicting the mechanical and thermal response of multi-layered materials and structures. Develops micro-mechanical and macromechanical relationships for laminated materials emphasizing continuous filament composites. Discusses the unique nature of composites and the advantages of designing with composites. *Preq:* ME 2040 with a C or better.
- ME 4310 Applied Fluids Engineering 3 (3)** Applications-oriented course in industrial fluids engineering, primarily directed toward the analysis and design of piping systems and components for liquid and gas flow. Topics include friction factors, head loss, flow capacities, piping networks, flow measurement, pumps, control valves, and hydraulic and pneumatic components. *Preq:* ME 3080 and ME 3330, each with a C or better.

- ME 4320* Advanced Strength of Materials 3 (3)** Topics in strength of materials not covered in ME 3020. Three-dimensional stress and strain transformations, theories of failure, shear center, unsymmetrical bending, curved beams, and energy methods. Other topics such as stress concentrations and fatigue concepts are treated as time permits. *Preq:* ME 2040 with a C or better.
- ME 4400 Materials for Aggressive Environments 3 (3)** Emphasizes the engineering aspects of selecting materials for applications in aggressive environments. Various types of materials degradation are discussed as are methods for wastage prevention, including especially engineering design and materials selection approaches. Structural metallic alloys are emphasized; however, technically important ceramics and polymers are also discussed. *Preq:* ME 3060 with a C or better.
- ME 4440 Mechanical Engineering Laboratory III 2 (6)** Continuation of ME 3330. Mechanical engineering principles and phenomena are reinforced through student-conducted experiments. Presentation of fundamentals of instrumentation, calibration techniques, data analysis, and report writing in the context of laboratory experiments. *Preq:* ME 3330; and MATH 3020 or STAT 4110, each with a C or better. *Preq or concurrent enrollment:* ME 3060 with a C or better.
- ME 4530* Dynamic Performance of Vehicles 3 (3)** Introduces techniques for analyzing the dynamic behavior of vehicles. Types of vehicles to be considered are chosen from aircraft, surface ships, automobiles and trucks, railway vehicles, and magnetically levitated vehicles. *Preq:* ME 3050 with a C or better.
- ME 4540 Design of Machine Elements 3 (3)** Design of common machine elements including clutches, brakes, bearings, springs, and gears. Optimization techniques and numerical methods are employed as appropriate. *Preq:* ME 3060 with a C or better.
- ME 4550* Design for Manufacturing 3 (3)** Concepts of product and process design for automated manufacturing are considered. Topics include product design for automated manufacturing, inspection and assembly, using automation, industrial robots, knowledge-based systems and concepts of flexible product manufacture. *Preq:* ME 3060 with a C or better. *Preq or concurrent enrollment:* ME 3120 with a C or better.
- ME (ECE) 4570* Fundamentals of Wind Power 3 (3)** Introduces wind turbine systems, including wind energy potential and application to power generation. Topics include wind energy principles, wind site assessment, wind turbine components, power generation machinery control systems, connection to the electric grid, and maintenance. May also be offered as ECE 4570. *Preq:* ECE 2070 or ECE 3200, with a C or better.
- ME 4710* Computer-Aided Engineering Analysis and Design 3 (2)** Students are exposed to geometric and solid modeling, finite elements, optimization, and rapid-prototyping. Students design an artifact, represent it on the computer, analyze it using FEA, then optimize before prototyping it. Emphasizes the use of computer-based tools for engineering design. *Preq:* ENGR 1090 and ME 2020, each with a C or better. *Coreq:* ME 4711.
- ME 4711* Computer-Aided Engineering Analysis and Design Laboratory 0 (3)** Non-credit laboratory to accompany ME 4710. *Coreq:* ME 4710.
- ME 4900 Creative Inquiry in Mechanical Engineering III 1-3 (1-3)** Students work in extended teams (including sophomores, juniors, seniors, and graduate students) addressing research and development problems under the supervision of a faculty lead. Engineering principles and best practices will be employed. Team work, professionalism, and communication skills are emphasized. May be repeated for a maximum of nine credits. *Preq:* Consent of instructor.
- ME 4930* Selected Topics in Mechanical Engineering 1-6 (1-6)** Study of topics not found in other courses. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Consent of instructor.
- MANAGEMENT**
Professors: L.D. Fredendall, V. Grover, M.A. McKnew, A.V. Roth, P.L. Roth, V. Sridharan, *Chair; Associate Professors:* P.T. Gianiodis, J. Miller, R.L. Purvis, T.L. Robbins, W.H. Stewart Jr., J.B. Thatcher, T.J. Zagenczyk; *Assistant Professors:* Y. B. Ferrand, A.E. Ingram, G. Ozkan, R. Raman, J.W. Ridge, K.D. Scott, S. Wang; *Senior Lecturer:* S.E. Yoder *Lecturers:* J.K. Bilbrey, K.D. Clark, M.A. Cole, J.E. Hopkins, Z. Leffakis, H. Li, H. Sun, M.M. Ward
- MGT 2010 Principles of Management 3 (3)** Management's role as a factor of economic production. Functions of management, principles of organization, and behavior in organizations. Includes Honors sections.
- MGT 2180 Management Personal Computer Applications 3 (6)** Personal computer applications that support managers. Students learn from hands-on work rather than lecture.
- MGT 2970 Creative Inquiry—Management 1-3 (1-3)** Students plan, develop, and execute a research project related to the field of management and present their findings. The development of the project includes lectures about research design, conduct, and data analysis. May be repeated for a maximum of six credits. Includes Honors sections.
- MGT 3050 Economics of Transportation 3 (3)** Topics include history and structure of transportation systems in the United States, the nature of transportation costs and rates, transportation systems as factors in industrial location, transportation policy, and the role of transportation in national security. *Preq:* Junior standing.
- MGT (ECON) 3060 Managerial Economics 3 (3)** Uses tools of economic analysis in classifying problems in organizing and evaluating information, and in comparing alternative courses of action. Bridges the gap between economic theory and managerial practices. May not be used to satisfy requirements for a degree in Economics. May also be offered as ECON 3060. *Preq:* ECON 2110.
- MGT 3070 Human Resource Management 3 (3)** Principles, concepts, and techniques concerned with effective and efficient utilization of personnel. Emphasizes motivation, leadership, and human behavior related to employer-employee relations. Topics include personnel recruitment, classification, selection, training, development, and performance evaluation. Includes Honors sections. *Preq:* STAT 3090 or equivalent (IE 3610 or MATH 3020 or PSYC 3090).
- MGT 3100 Intermediate Business Statistics 3 (3)** Quantitative methods of the management scientist with applications to business and industrial problems. Topics include regression analysis, correlation analysis, analysis of variance, sampling, and nonparametric methods. Includes honors sections. *Preq:* STAT 3090 or equivalent (IE 3610 or MATH 3020 or PSYC 3090); and MGT 2180 or equivalent (CPSC 2200).
- MGT 3120 Decision Models for Management 3 (3)** Exploration of ways in which management science decision models can help in making sound managerial decisions. Problem solving is Excel-based. Topics include linear programming, project scheduling, and simulation. Includes Honors sections. *Preq:* STAT 3090 or equivalent (IE 3610 or MATH 3020 or PSYC 3090); and MGT 2180 or equivalent (CPSC 2200).
- MGT (ELE) 3150 New Venture Creation 3 (3)** Through the development of a business plan, the course focuses on creating an organization capable of effectively exploiting a viable opportunity. Topics include organization strategy and design, start-up capital, operations and sourcing issues, leadership, team building, and management of rapid growth. May also be offered as ELE 3150. *Preq:* ELE 3010.
- MGT 3170 Logistics Management 3 (3)** Management of physical distribution and supply systems with emphasis on design concepts, cost determinants, and control. *Preq:* MGT 3120.
- MGT 3180 Management of Information Systems 3 (3)** Introduction to information systems concepts and applications in business. Topics include software, hardware, decision support and knowledge based systems, database, information systems design and implementation, and the management of information systems. *Preq:* MGT 2010.
- MGT 3500 Introduction to Business Analytics 3 (3)** Introduces students to the common language, terminology and concepts related to business analytics, as well as to the business analyst profession. Students learn foundational technical, business and statistical concepts and skills. *Preq:* ACCT 3220 or MGT 3180.
- MGT 3900 Operations Management 3 (3)** Examines the role of operations management in both manufacturing and service organizations. Discusses the concepts, tools, and techniques for managing the operations function. Topics include operations strategy, design, planning, and control. *Preq:* STAT 3090 or equivalent (IE 3610 or MATH 3020 or PSYC 3090); and MGT 2180 or equivalent (CPSC 2200).

- MGT 3980 Internship in Management 1-3 (1-3)** Faculty-supervised management internship to give students learning opportunities that support their classroom experiences. Requires at least 150 hours of internship work per credit hour received. Course enrollment and internship must occur in the same semester. May be repeated for a maximum of three credits. To be taken Pass/No Pass only. *Preq:* Junior standing and a 2.0 cumulative grade-point average and consent of instructor.
- MGT 4000 Management of Organizational Behavior 3 (3)** Provides management students with a framework for understanding how behavior within business organizations is managed. Particular emphasis is on integrating management theory with recent developments in the behavioral sciences with distinct management applications. Theory, research, and business applications are considered. *Preq:* MGT 2010.
- MGT 4020 Operations Planning and Control 3 (3)** Managing, planning, and controlling production and service operations emphasizing demand forecasting, aggregate planning, production scheduling, and inventory management. Includes Honors sections. *Preq:* MGT 3900.
- MGT 4030 Special Problems 1-3 (1-3)** Students plan, develop, and execute a research project related to the field of management and defense studies. May be repeated for a maximum of six credits. *Preq:* Senior standing in Management.
- MGT 4040 Advanced Statistical Quality Control 3 (3)** Statistical quality control techniques as applied to all areas of quality control: process control, process capability, acceptance sampling, and economic aspects of quality decisions. *Preq:* MGT 3900.
- MGT 4080 Lean Operations 3 (3)** Examines the use of scientific methods for the design of operating systems for both manufacturing and services. Special emphasis is on the development of the Toyota Production System for continuous improvement and the application of the relevant techniques to the design of facilities, jobs, and systems. *Preq:* MGT 3900.
- MGT 4110 Project Management 3 (3)** Examination and application of the project management body of knowledge. This consists of theory, tools, and techniques to organize, plan, and control individuals, teams, quality, and operations while conducting a project. *Preq:* STAT 3090 or equivalent (IE 3610 or MATH 3020 or PSYC 3090).
- MGT 4120 Sourcing and Supplier Management 3 (3)** Provides an understanding of the key issues in selecting and developing suppliers. Provides a conceptual framework to understand purchasing's function within the firm and its role in supply chain management. *Preq:* MGT 3900.
- MGT 4150 Business Strategy 3 (3)** Capstone course for seniors. Various methods are used in analyzing complex business problems, requiring students to integrate their knowledge of all areas of business. Student participation and written and oral communications are stressed. Includes Honors sections. Students must take this course at Clemson University. *Preq:* FIN 3060 or 3110; and MGT 2010; and MKT 3010; and Senior standing.
- MGT 4160 Special Topics in Human Resources 3 (3)** In-depth examination of advanced topics in Human Resource Management based on the developments in the Human Resource profession and interests of faculty. Emphasizes the strategic formulation and application of these topics to support organizational leadership. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* MGT 3070 and MGT 4000.
- MGT 4220 Small Business Management 3 (3)** Study of management of the small independently owned and operated business. Emphasizes analyzing new business opportunities, planning and establishing a growing concern, and managing the contemporary small business. Field experience in consulting with small businesses enhances students understanding of the unique opportunities and problems of small business organizations. *Preq:* MKT 3010.
- MGT 4230 International Business Management 3 (3)** Survey of theoretical and institutional complexities of international business operations. Topics include exporting, importing, foreign investment, multinational corporations, and international payment system. *Preq:* Junior standing.
- MGT 4240 Global Supply Chain Management 3 (3)** Design, planning, control, and improvement of supply chains for competing effectively in the context of global operations. Topics include supply chain structure and configuration, approaches to intra-organizational and inter-firm integration, and complexities of material, information, and cash flows across international borders. *Preq:* MGT 3900.
- MGT 4250 Compensation Management 3 (3)** Examination of compensation employees seek in exchange for their efforts and contributions. Topics include government and union influences; job content analysis, description, and evaluation; developing pay structures; measuring and paying for performance; employee benefits; administration of the compensation plan; executive, managerial, professional, and sales. *Preq:* MGT 3070 and MGT 4000.
- MGT 4270 Managing Continuous Improvement 3 (3)** Examination of issues related to continuous improvement, including a systematic approach to selecting improvement areas, determining how to improve, plan, and manage the improvement process. Topics include selecting performance measurements, using teams to achieve breakthrough change, identifying root causes of problems, and developing and implementing solutions to problems. *Preq:* MGT 3900.
- MGT 4300 Senior Seminar in Management 3 (3)** In-depth study of current business topics; allows senior Management students to relate their academic studies to real-world problems. Senior paper is required. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Senior standing.
- MGT 4310 Employee Diversity, Rights, and Responsibilities 3 (3)** Focuses on employee and organizational rights and responsibilities. Topics include various types of discrimination (race, sex, religion, national origin, age, and disability status); drug and alcohol testing; AIDS in the workplace; employee discipline and termination issues; privacy and safety concerns; and union organizing campaigns. *Preq:* MGT 3070 or MGT 4000.
- MGT 4350 Personnel Interviewing 3 (3)** Helps students understand current interviewing theory, conduct an employment interview, and advise their future employers how to improve interviewing programs. Topics include job analysis, legal issues, types of interviews, and evaluating applicants. *Preq:* MGT 3070 or MGT 4000.
- MGT 4360 White-Collar Crime 3 (3)** White-collar crime and corruption are examined from a managerial perspective. Topics include financial crimes, crimes against consumers, environmental crimes, acts of institutional corruption, the impact of organized crime on legitimate businesses, and computer crime. *Preq:* Senior standing. *Preq or concurrent enrollment:* FIN 3060.
- MGT 4400 Negotiations 3 (3)** Focuses on principles and practice in business negotiations. Topics include negotiating concepts, strategies, situational applications, and practice in applied techniques. Situations include negotiation in sales, customer relations, global nuances in negotiation situations, employee management, and career development. *Preq:* Senior standing.
- MGT (IE) 4440 International Perspectives in Industrial Management 1-6 (1-6)** Provides an international perspective to industrial management via organized plant visits to businesses in a foreign country and lectures by and discussions with senior operations managers. Cultural visits and lectures are also organized to provide a holistic perspective to cover cultural and economic environment of the host country. Students are responsible for travel costs. May be repeated for a maximum of six credits. May also be offered as IE 4440. *Preq:* Consent of instructor.
- MGT 4500 Advanced Business Analytics 3 (3)** Students' understanding of business analytics is deepened through practical case studies and projects. Students conduct analysis using business analytics software applications and apply business analytics skills to solve real-world problems. *Preq:* MGT 3500.
- MGT 4520 Business Analysis 3 (3)** Follows the traditional systems development life cycle (SDLC), although alternative methodologies are also discussed. Focuses on earlier phases of the SDLC, from IS planning through specification of structured requirements and on the methods, techniques, and tools used to determine information requirements and their unambiguous documentation. *Preq:* MGT 3180; or MGT 2010 and ACCT 3220; or MGT 2010 and CPSC 2150 and CPSC 2310.
- MGT 4540 Systems Implementation 3 (3)** Builds upon skills of programming, database, and systems analysis and design by involving students with the later phases of the systems development life cycle (SDLC). Students design and develop a system using various platforms. Focus is on the logical and physical system design. *Preq:* CPSC 4620 or MGT 4520.

MGT 4550 Emerging Information Technology Trends in Business 3 (3) In-depth study, through case studies, readings, and hands-on experience, of emerging information technologies in and across business organizations. Focuses on understanding, effective deployment, and impact of these technologies on business outcomes. *Preq:* MGT 3180; or MGT 2010 and ACCT 3220; or MGT 2010 and CPSC 2150 and CPSC 2310.

MGT 4560 Business Information Management 3 (3) In-depth study of business related data, information, and knowledge-based systems as well as business intelligence technologies and techniques, through readings, hands-on experience, and case studies. Emphasizes organizational decision-making and the ability to access data, information and knowledge-based assets where and when needed. *Preq:* MGT 3180; or MGT 2010 and ACCT 3220; or MGT 2010 and CPSC 2150 and CPSC 2310.

MGT 4900 Selected Topics in Industrial Management 3 (3) In-depth examination of advanced topics in Industrial Management. Topics may vary in keeping with developments in the management profession and interests of faculty. Emphasizes the application of these topics to the production and operations management environment. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* MGT 4020 or 4040 or 4080.

MGT 4970 Creative Inquiry—Management 1-3 (1-3) Students plan, develop, execute, and direct a research project related to the field of management and present their findings. The project includes lectures about research design, conduct, and data analysis. May be repeated for a maximum of six credits. Includes Honors sections.

MICROBIOLOGY

Professors: R.S. Cohen, Chair, T.A. Hughes, X. Jiang, C.D. Rice, S.W. Scott, Y. Wei; *Associate Professor:* B.J. Campbell, M. Cao, J.M. Henson, H.D. Kurtz, T.L. McNealy, T.R. Tzeng; *Assistant Professors:* V.P. Richards; *Senior Lecturers:* J.G. Abercrombie, K.B. Rudolph; *Lecturer:* K.J. Whitehead

MICR 1010 Microbes and Human Affairs 1 (1) Introduces Microbiology majors to University career and library services, evaluation of computer program proficiency, Web page development, Microbiology emphasis areas, and Microbiology faculty. Students initiate their own Web-based student portfolios, which showcase their skills and experiences (e.g., résumés, accomplishments, and work samples) during their undergraduate programs. *Preq or concurrent enrollment:* BIOL 1030 and BIOL 1050; or BIOL 1100.

MICR 2050 Introductory Microbiology 4 (3) Basic concepts of microbiology, introduced through classroom and laboratory experiences. Emphasizes practical applications in various areas of importance to man. Recommended for students not majoring in a biological science. Not open to Microbiology majors. *Preq:* CH 1010; and one of the following combinations: BIOL 1030 and BIOL 1050; or BIOL 1100 and BIOL 1110. *Coreq:* MICR 2051.

MICR 2051 Introductory Microbiology Laboratory 0 (3) Non-credit laboratory to accompany MICR 2050. *Coreq:* MICR 2050.

MICR 3000 Essential Skills in Microbiology 3 (3) Equips students with skills needed to achieve success in a variety of scientific fields, with emphasis on microbiology. The course focuses on career-building skills, scientific ethics, and scientific written communication.

MICR 3050 General Microbiology 4 (3) Morphology, physiology, classification, distribution, and cultivation of microorganisms. *Preq:* CH 1010 and CH 1020; and one of the following combinations: (BIOL 1030 and BIOL 1040 and BIOL 1050 and BIOL 1060) or (BIOL 1100 and BIOL 1110). *Coreq:* MICR 3051.

MICR 3051 General Microbiology Laboratory 0 (3) Non-credit laboratory to accompany MICR 3050. *Coreq:* MICR 3050.

MICR 3940 Selected Topics in Creative Inquiry I 2-3 (2-3) Disciplinary and multidisciplinary group research projects with the goal of developing the students' ability to discover, analyze, and evaluate data. Students are required to document their research activities in their portfolios. May be repeated for a maximum of six credits. Honors students must take at least six credits over a two-semester period with the same research advisor and write an honors thesis. These credits may include MICR 3940, MICR 4940 or both. Includes Honors sections. *Preq:* Consent of instructor. *Coreq:* MICR 3941.

MICR 3941 Selected Topics in Creative Inquiry I Laboratory 0 (3-6) Non-credit laboratory to accompany MICR 3940. *Coreq:* MICR 3940.

MICR 4000* Public Health Microbiology 3 (3) Epidemiology of transmissible diseases including pathogenic characteristics of the infectious organism, modes of transmission, mechanism of infection, diagnostic aids, effective treatments, immunizing procedures, and methods of preventing infection. Includes Honors sections. *Preq:* MICR 3050.

MICR 4010* Microbial Diversity and Ecology 3 (3) In-depth survey of microbial morphology, ecology, and diversity. Study of the interaction and adaptation of microbes in a wide range of environmental conditions, including consideration of their metabolism, nutrition, growth and the use of microbiological assays. Includes Honors sections. *Preq:* CH 2010 and 2020 or CH 2230; and CH 2270; and MICR 3050.

MICR *4020 Environmental Microbiology 3 (3) Discussion of microorganisms in air, terrestrial, and aquatic environments and how they are used for environmental restoration activities. Topics include the nature of biofilms, interactions of microbes with inorganic and organic constituents, processes to implement bioremediation in surface/subsurface environments, and treatment of solid, liquid, and gaseous waste streams. *Preq:* MICR 3050 and MICR 4010; and either CH 2010; or both CH 2230 and CH 2270.

MICR 4030* Marine Microbiology 3 (3) Discussion of the microbes that inhabit the marine environment, their peculiar physiological traits, and contributions to the ecology of oceans. *Preq:* MICR 3050; and either CH 2010 and CH 2020; or both CH 2230 and CH 2270.

MICR 4050* Advanced Microbial Ecology of Humans 3 (3) Investigation of the complex ecological relationships between microbes and their human hosts, including investigation of the normal microbial community in various body systems, factors that change the microbiota, and the role of the microbiota in normal development, health and disease of the host. *Preq:* MICR 4010 with a grade of C or better.

MICR 4070* Food and Dairy Microbiology 4 (3) Physical-chemical factors limiting survival and growth of microorganisms during processing and manufacturing of food and dairy products. Standard methods for enumerating and identifying indicator bacteria, yeasts, molds, and microbes producing food and food-borne illness. Starter cultures, fungal toxins, microbial cell injury and standards for food and dairy products. Includes Honors sections. *Preq:* MICR 3050; and one of BCHM 3050 or CH 2010 or CH 2230. *Coreq:* MICR 4071.

MICR 4071* Food and Dairy Microbiology Laboratory 0 (3) Non-credit laboratory to accompany MICR 4070. *Coreq:* MICR 4070.

MICR 4100* Soil Microbiology 3 (3) Role of microorganisms in the decomposition of organic substances, transformation of nitrogen and mineral substances in the soil; interrelationships between higher plants and microorganisms; importance of microorganisms in soil fertility. Includes Honors sections. *Preq:* MICR 3050; and MICR 4010 or PES 4900.

MICR 4110* Pathogenic Bacteriology 3 (3) Study of pathogenic bacteria and their virulence mechanisms. Emphasizes host-microbe interactions, responses to infection and treatment, and research strategies for various topics of bacterial pathogenesis. Includes Honors sections. *Preq:* MICR 3050 and MICR 4120 and MICR 4140.

MICR 4120 Bacterial Physiology 3 (3) Consideration of the cytology, physiology, metabolism, and genetics of bacteria. Includes studies of growth and death, reproduction and mutation, nutrition and metabolic pathways, regulatory mechanisms, and effects of environment. Includes Honors sections. *Preq:* CH 2240 and MICR 3050; and either BCHM 3010 or BCHM 3050.

MICR 4130* Industrial Microbiology 3 (2) Microbial aspects of large-scale processes for the production of foods, antibiotics, enzymes, fine chemicals, and beverages. Topics include strain selection, culture maintenance, biosynthetic pathways, continuous cultivation and production of single cell protein. Includes Honors sections. *Coreq:* MICR 4131.

MICR 4131* Industrial Microbiology Laboratory 0 (3) Non-credit laboratory to accompany BIOL 4130. *Coreq:* MICR 4130.

MICR (AVS, BIOL) 4140* Basic Immunology 3 (3) Introduction to the immune system of vertebrate animals, with an emphasis on structure, function, regulation, and cellular and molecular mechanisms of immune responses. Includes honors sections. May also be offered as AVS 4140 or BIOL 4140. *Preq:* BIOL 4610 and MICR 3050.

- MICR 4150* Microbial Genetics 3 (3)** Investigates the molecular basis of microbial lives. Topics include essential genes involved in DNA, RNA and protein metabolism; mutations and genome evolution; global gene regulation; and genetic analysis, using both forward and reverse genetics. Includes Honors sections. *Preq:* MICR 4120; and BCHM 3010 or BCHM 3050. Non-Microbiology majors do not have to have taken MICR 4120, but must request a registration override from the instructor to enroll in this course.
- MICR 4160* Introductory Virology 3 (3)** Introduction to the field of virology, including animal, bacterial, and plant viruses. Topics include nomenclature and classification, biochemical and biophysical characteristics, mechanisms of replication, chemotherapy, and techniques for isolation, assay, and purification. Includes Honors sections. *Preq:* MICR 3050; and either BCHM 3010 or BCHM 3050.
- MICR 4170* Cancer and Aging 3 (3)** Discusses alterations that occur at molecular, cellular and tissue levels during cell transformation and aging. Topics include the cell division cycle, signal transduction pathways, oncogenes and tumor suppressors, cell death and cell aging. Includes Honors sections. *Preq:* MICR 3050 and BIOL 4610; and either BCHM 3010 or 3050.
- MICR 4190* Selected Topics in Molecular Medicine 3 (3)** Introduction to various areas of molecular medicine. Examines the latest research and developments in molecular medicine. Designed for students interested in medicine and biomedical research. Graduate students may repeat for a maximum of six credits. *Preq:* BCHM 3010 or BCHM 3050 or MICR 3050.
- MICR 4210 Pathogenic Bacteriology Laboratory 1 (3)** Complements the pathogenesis research topics covered in the pathogenic bacteriology lecture. These topics are important at practical levels for prevention and treatment of bacterial diseases. Laboratory is used to teach pathogen handling, basic identification techniques, and modern molecular protocols for pathogen identification. *Preq:* MICR 4140. *Preq or concurrent enrollment:* MICR 4110.
- MICR 4220 Bacterial Physiology Laboratory 1 (3)** Laboratory topics corresponding to MICR 4120 lecture. The course will train students in the proper handling of bacteria and will teach techniques for growing and maintaining bacterial cultures while avoiding contamination. *Preq or concurrent enrollment:* MICR 4120.
- MICR (AVS, BIOL) 4240 Immunology Laboratory I 3 (3)** This course is designed to apply the knowledge gained in MICR 4140, Immunology lecture, in an applied setting. The experiments in this beginning immunology laboratory are designed to study both the innate and acquired immune systems. Experimentation into the formation, function and detection of antibodies provides students with skills in basic immunologic techniques. May also be offered as AVS 4240 or BIOL 4240. *Preq or concurrent enrollment:* MICR 4140.
- MICR 4250* Microbial Genetics Laboratory 1 (3)** Complements the genetics topics covered in the Microbial Genetics lecture. These topics are important at practical levels for molecular and genetics studies. The laboratory is used to teach basic cloning techniques, the basis of blue/white screening, isolation of mutants, calculation of mutation rate, as well as gene regulation. *Preq or concurrent enrollment:* MICR 4150.
- MICR 4270* Cancer and Aging Laboratory 1 (3)** The laboratory is used to teach the basic molecular protocols for cancer and aging research, and will help students to understand the mechanisms of cancer and aging discussed in lecture. *Preq or concurrent enrollment:* MICR 4170.
- MICR 4300* Soil Microbiology Laboratory 1 (3)** Examines microbes residing in the soil and their effects on the soil substratum and resident plant communities. Topics include biogeochemistry, microbial isolation, microcosm development, and characterization of soil microbial communities. *Preq or concurrent enrollment:* MICR 4100.
- MICR 4310 Microbial Diversity and Ecology Laboratory 1 (3)** Provides a laboratory experience to complement topics covered in the Microbial Diversity and Ecology lecture. These topics are important at practical levels to better understand the diversity of microbes in various ecosystems. The laboratory is used to learn sampling techniques, preparation of microbial media, basic identification techniques, and modern molecular protocols for microbe identification, such as PCR and 16S rDNA gene sequencing. *Preq or concurrent enrollment:* MICR 4010.
- MICR 4500 Advanced Microbiology Laboratory I 2 (1)** Application of knowledge and techniques learned in the Introductory Microbiology Lab with new topics on microbial ecology, diversity and physiology. Experiments in soil, marine and environmental microbiology will be conducted. *Preq:* MICR 4010. *Coreq:* MICR 4501.
- MICR 4501 Advanced Microbiology Laboratory I Laboratory 0 (2)** Non-credit laboratory to accompany MICR 4500. *Coreq:* MICR 4500.
- MICR 4510 Advanced Microbiology Laboratory II 2 (1)** Application of knowledge and techniques learned in the Advanced Microbiology Lab I with new topics in microbial cell biology and microbial genetics. *Preq:* MICR 4120 and MICR 4500. *Coreq:* MICR 4511.
- MICR 4511 Advanced Microbiology Laboratory II Laboratory 0 (2)** Non-credit laboratory to accompany MICR 4510. *Coreq:* MICR 4510.
- MICR 4520 Advanced Microbiology Laboratory III 2 (1)** Application of knowledge and techniques learned in the Advanced Microbiology Labs I and II with new topics on pathogenic bacteriology, parasitology, virology and immunology. *Preq:* MICRO 4510. *Coreq:* MICR 4521.
- MICR 4521 Advanced Microbiology Laboratory III Laboratory 0 (2)** Non-credit laboratory to accompany MICR 4520. *Coreq:* MICR 4520.
- MICR (BIOL) 4560* Medical and Veterinary Parasitology 3 (3)** Introduction to parasitism in the animal kingdom. Emphasizes basic and applied principles related to economically and medically important diseases. Classical and experimental approaches to the study of parasitism are examined in reference to protozoa, helminths, and arthropods. Includes Honors sections. May also be offered as BIOL 4560. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110. *Coreq:* MICR 4570.
- MICR 4570* Medical and Veterinary Parasitology Laboratory 2 (1)** Laboratory to reinforce material presented in BIOL 4560. Introduces students to both live and preserved human/animal parasites. Also introduces techniques used in collection, preservation, and examination of animal parasites. Includes Honors sections. *Coreq:* MICR 4560 and MICR 4571.
- MICR 4571* Medical and Veterinary Parasitology Laboratory 0 (2)** Non-credit laboratory to accompany MICR 4570. *Coreq:* MICR 4570.
- MICR 4910 Undergraduate Research in Microbiology I-4 (1-4)** Individually mentored research problems in various areas of microbiology that introduce undergraduate students to the planning and execution of research experimentation and the presentation of research findings. May be repeated for a maximum of eight credits with consent of instructor. Honors students must take at least six hours under a single research advisor over two semesters. Honors thesis is required. Includes Honors sections. *Preq:* Consent of instructor.
- MICR 4920 Internship in Microbiology 0-4 (1-4)** Preplanned internship at an advisor-approved facility to give students learning opportunities beyond their classroom experiences. Students submit a Student Internship Contract and a study plan before the internship and a comprehensive report within one week of the end of the internship. May be repeated for a maximum of six credits. To be taken Pass/No Pass only. *Preq:* Consent of instructor.
- MICR 4930 Senior Seminar 2 (2)** Capstone course engaging students in analysis and discussion of publications from the technical and non-technical literature in biological sciences and from current topics of biology appearing in other media. Students complete their undergraduate on-line digital portfolios. Emphasis is placed on ethical issues that arise as a result of biological research. *Preq:* Senior standing and COMM 1500 or COMM 2500 or ENGL 3150.
- MICR (BIOL) 4940 Selected Topics in Creative Inquiry II 2-3 (1-3)** Disciplinary and multidisciplinary group research projects with the goal of developing the students' ability to discover, analyze, and evaluate data. Students are required to document their research activities in their portfolios. May be repeated for a maximum of six credits. Honors students must take at least six credits over a two-semester period with the same research advisor and write an honors thesis. These credits may include BIOL 3940, BIOL 4940 or both. Includes Honors sections. May also be offered as BIOL 4940. *Preq:* Consent of instructor. *Coreq:* MICR 4941.
- MICR (BIOL) 4941 Selected Topics in Creative Inquiry II Laboratory 0 (3-6)** Non-credit laboratory to accompany MICR 4940. May also be offered as BIOL 4941. *Coreq:* MICR 4940.

MICR 4950 Service Learning in Biology 2-4 (1-2) Combines service and academic learning while helping pre-college or college students learn about the fundamental aspects of science. Provides lecture and laboratory experiences as students learn to prepare and participate in supervised laboratory teaching for pre-college or college students. May be repeated for a maximum of six credits. *Prq:* Consent of instructor. *Coreq:* MICR 4951.

MICR 4951 Service Learning in Biology Laboratory 0 (3-9) Non-credit laboratory to accompany MICR 4950. *Coreq:* MICR 4950.

MARKETING

Professors: M.J. Dorsch, S.J. Grove, G.M. Pickett, M.A. Raymond, *Chair;* *Associate Professors:* R. Gomes, C.D. Hopkins, P.A. Knowles, J.N. Moore, P.D. Weathers; *Assistant Professors:* D.H. Bennett, R.R. Mullins, J.C. Siemens, S.D. Swain, A.E. Thyroff; *Visiting Professor:* W.E. Kilbourne; *Lecturers:* A.C. Fine, J.G. Gaubert, C.W. McElveen

MKT 2980 Creative Inquiry—Marketing 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. *Prq:* Consent of faculty member/mentor.

MKT 3010 Principles of Marketing 3 (3) Principles and concepts involved in planning, pricing, promoting, and distributing of goods and services. Includes Honors sections. *Prq:* ECON 2000 or ECON 2110 or ECON 2120 or any 2000-level AGRB course; and sophomore standing.

MKT 3020 Consumer Behavior 3 (3) Examination of selected individual and group behavioral science concepts and their application to the understanding of consumer decision making. *Prq:* MKT 3010.

MKT (ELE) 3140 New Venture Creation I 3 (3) First in a two-part series that continues with MGT (ELE) 3150 assessing entrepreneurial opportunities. Focuses on creativity, idea generation, market opportunity analysis, strategy, and methods of entry. Opportunity analysis may be developed into a full new venture plan in ELE 3150 or MGT 3150. May also be offered as ELE 3140. *Prq:* Junior standing.

MKT 3210 Sports Marketing 3 (3) Exploration of the essentials of effective sports marketing. Topics include application of marketing principles in the sports area, licensing issues, sponsorships and endorsements, stadium and arena marketing, broadcasting and media considerations, public policy and sports, and unique marketing challenges for sport specific products (football, basketball, baseball, motorsports, etc.) *Prq:* MKT 3010.

MKT 3310 Marketing Metrics and Analytics 3 (3) Examines the derivation, meaning, use and communication of marketing metrics used to facilitate decision making in various areas, including, but not limited to, online and social media strategy, advertising, pricing, branding and product development. Students are also introduced to database management, including the use of Microsoft Excel. *Prq:* MKT 3010 and STAT 3090.

MKT 3900 Junior Honors Research 1 (1) Students select and complete a research project approved by a faculty advisor, in conjunction with an approved three-credit marketing course (other than MKT 3010 or 4310). Students are expected to display a command of marketing theory and an ability to apply theory to their research. *Prq:* MKT 3010 and membership in Calhoun Honors College and consent of faculty member supervising research.

MKT 3980 Creative Inquiry—Marketing 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits. *Prq:* Consent of faculty member/mentor.

MKT 3990 Marketing Internship 3 (3) Pre-planned, preapproved, faculty-supervised marketing internships. Credit is only given for internships of at least ten full-time, consecutive weeks with the same internship provider. To be taken Pass/No Pass only. May be taken only once. *Prq:* MKT 3010 and consent of instructor.

MKT 4200 Professional Selling 3 (3) Current theories about the selling of goods and services to organizational buyers in the context of long-term relationships. Role playing, video-taped presentations, and other techniques are generally employed to enhance interpersonal communication skills. *Prq:* Junior standing and MKT 3010.

MKT 4230* Promotional Strategy 3 (3) Emphasizes promotion as the communication function of marketing. Attention is given to communication theory and promotion's relation to mass and interpersonal communication. Factors affecting promotional decision-making process are explored, and promotion as a competitive tool is examined. *Prq:* MKT 3010.

MKT 4240 Sales Management 3 (3) Comprehensive examination of the planning, implementation, and control of professional sales organizations. *Prq:* MKT 3010 and MKT 4200.

MKT 4250 Retail Management 3 (3) Retailing is studied from a decision-making approach. Topics include target market analysis, location analysis, merchandising, human resources, pricing and promotion. *Prq:* MKT 3010.

MKT 4260 Business-to-Business Marketing 3 (3) Study and analysis of the unique aspects of marketing goods and services to organizational buyers rather than household consumers. Emphasis is on developing strategic responses to market opportunities given competitive behavior. *Prq:* MKT 3010.

MKT 4270* International Marketing 3 (3) Study of marketing from the international point of view. Emphasis is on the necessary modification of marketing thinking and practice for foreign markets due to individual environmental differences. *Prq:* MKT 3010.

MKT 4280* Services Marketing 3 (3) Exploration and study of the nature of service organizations and the principles that guide the marketing of their products. Emphasis is on a marketing mix that is fundamentally different than that found in traditional goods marketing. *Prq:* MKT 3010.

MKT 4290* Public and Nonprofit Marketing 3 (3) Examines the role and application of marketing in public and nonprofit settings. Focuses on a conceptual understanding of the marketing discipline and marketing processes and shows how basic concepts and principles of marketing are applicable to public and nonprofit organizations. *Prq:* MKT 3010.

MKT 4300* Marketing Product Management 3 (3) Management of the firm's product or service offerings. Topics include new product screening, evaluation, and development; product line and mix analysis, abandonment decisions, brand manager's role, new product development department, and others. Emphasis is on decision making. *Prq:* MKT 3010.

MKT 4310 Marketing Research 3 (3) Research used in marketing decision making. Emphasizes methods and techniques used in planning, collection, processing, and utilizing information. Topics include research design, sources of information, questionnaire design, sampling, data collection, and data analysis. *Prq:* Marketing major and MKT 3010 and STAT 3090. *Prq or concurrent enrollment:* MKT 3310.

MKT 4330 Sport Marketing Strategy 3 (3) Provides students with basic knowledge about brand management as it applies to sport. Addresses basic principles and guiding precepts of how sport-based organizations build strong brands. *Prq:* MKT 3210.

MKT 4340 Sport Promotion 3 (3) Emphasizes the promotional function of sport. Topics include event sponsorship, developing media relationships, endorsements, promotion objective setting and budgeting, media planning and scheduling, and utilizing the tools of promotion within a sport context. Integrated Marketing Communication provides the theoretical and managerial framework for how these factors are utilized optimally. *Prq:* MKT 3210.

MKT 4430 Advertising Strategy 3 (3) Advertising strategy emphasizing knowledge of target audiences, along with the messages to communicate effectively with them. Foundations include knowing, motivating, and changing behavior of target audience. Issues include models for decisions, tools for promotion, and integrated advertising plans. *Prq:* MKT 3010.

MKT 4450 Macromarketing 3 (3) Examines the relationship between marketing and society, focusing on the social impact of marketing practices. Topics include technology, ethics, materialism, globalization, environmental sustainability, and the political and economic philosophy underlying marketing. Course is multidisciplinary and uses a variety of readings to cover each topic area. *Prq:* MKT 3010 and junior standing.

MKT 4500 Strategic Marketing Management 3 (3) Application of marketing constructs in analyzing and solving marketing problems. Emphasizes information systems, data analysis, and critical-thinking skills in solving marketing problems in a wide range of managerial decision areas, including, but not limited to, new product development, pricing, advertising, personal selling, channels, and international marketing. *Prq:* Marketing major and MKT 3010 and six credits of 4000-level marketing courses.

MKT 4900 Senior Honors Thesis Research 3 (3)
Students, in consultation with a Marketing faculty member, choose a topic for the honors thesis and produce a research proposal that involves an imaginative approach to the subject, a sufficient literature review, a comprehensive introduction to the research topic, and a detailed research plan.
Preq: MKT 3900.

MKT 4910 Senior Honors Thesis Writing and Presentation 3 (3)
Students implement their research plans, write up their reports, and present and defend their Senior Honors Theses to an audience of Marketing faculty, Honors students, and invited others.
Preq: MKT 4900.

MKT 4950* Selected Topics 3 (3)
In-depth examination of timely topics in marketing. May be repeated for a maximum of 15 credits, but only if different topics are covered.
Preq: MKT 3010.

MKT 4980 Creative Inquiry—Marketing 1-4 (1-4)
In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of six credits.
Preq: Consent of faculty member/mentor.

MKT 4990 Independent Study 1-3 (1-3)
Directed readings or independent research in selected marketing areas. Topics must be selected and proposed by student. Proposals must be approved by instructor. May be repeated for a maximum of three credits.
Preq: MKT 3010 and consent of instructor.

MILITARY LEADERSHIP

Professor: J. Mullinax, *Chair*; *Assistant Professors:* C. Crawford, E. Bonilla, R. Rozetar, M. Samuelson

ML 1010 Leadership Fundamentals I 2 (2)
Study of leadership focused at the individual level. Students learn effective communicating skills, ethical decision making, small group management, and mental and physical conditioning. Skills are applied in a variety of challenging training events during laboratory, including rappelling, water survival, land navigation, and team athletics.
Coreq: ML 1011.

ML 1011 Leadership Fundamentals I Laboratory 0 (1)
Non-credit laboratory to accompany ML 1010.
Coreq: ML 1010.

ML 1020 Leadership Fundamentals II 2 (2)
Continued study of leadership focused at the individual and team levels. Topics include problem solving, critical thinking, leadership styles, and group cohesion. Leadership laboratory training includes small tactics and weapons firing.
Coreq: ML 1021.

ML 1021 Leadership Fundamentals II Laboratory 0 (1)
Non-credit laboratory to accompany ML 1020.
Coreq: ML 1020.

ML 2010 Leadership Development I 3 (2)
Study of leadership focused at the team level. Students develop leadership skills through public speaking, managing small groups, and mentoring first-year students. Skills are applied in a variety of challenging training events during leadership laboratory, including rappelling, water survival, land navigation, and team-building exercises.
Coreq: ML 2011.

ML 2011 Leadership Development I Laboratory 0 (2)
Non-credit laboratory to accompany ML 2010.
Coreq: ML 2010.

ML 2020 Leadership Development II 3 (2)
Continued study of leadership at the team and small group levels. Focuses on moral leadership, officership, and the Army as a profession. Leadership laboratory training includes small unit tactics, airmobile operations, and weapons firing. Students lead teams throughout the semester.
Coreq: ML 2021.

ML 2021 Leadership Development II Laboratory 0 (2)
Non-credit laboratory to accompany ML 2020.
Coreq: ML 2020.

ML 2100 Leaders Training Course 4 (8)
Five-week leadership camp conducted on an Army post. Students' pay and expenses are provided by the U.S. Army. Environment is rigorous and focused on leadership development. No military obligation is incurred. Completion of this course qualifies students for entry into the Army ROTC Advanced Course.

ML 3010 Advanced Leadership I 4 (2)
Study of leadership focused on decision making, planning, communicating, and executing. Addresses motivational techniques, the role of a leader, and performance assessment. Provides students with leadership management tools and methodology. Students are responsible for training, developing, and mentoring Basic Course students. Students apply learned techniques in leadership laboratory.
Preq: ML 2020 or ML 2100. *Coreq:* ML 3011.

ML 3011 Advanced Leadership I Laboratory 0 (4)
Non-credit laboratory to accompany ML 3010.
Coreq: ML 3010.

ML 3020 Advanced Leadership II 4 (2)
Continuation of leadership study focusing on collective skills training, tactics, and small group instruction. Synthesizes various components of training, leadership, and team-building learned during the Basic Course and ML 3010. Final step in students' progression prior to the Leader's Development and Assessment Course.
Preq: ML 3010. *Coreq:* ML 3021.

ML 3021 Advanced Leadership II Laboratory 0 (4)
Non-credit laboratory to accompany ML 3020.
Coreq: ML 3020.

ML 3900 American Army Military Experience 3 (3)
Covers the purpose of the American military experience from its Colonial origins to today's War on Terrorism. Topics include the evolution of U.S. joint forces and coalition operations, effects of United States society on its military, and how leaders utilize the military decision making process. How historical leaders developed critical thinking skills about the human dimensions of war is also discussed.
Preq: Enrollment in Army ROTC program.

ML 4010 Organizational Leadership I 4 (2)
Culmination of leadership study in preparation for commissioning as Army officers. Students continue exercising leadership and management skills as senior cadet leaders. Leadership instruction focuses on coordinating activities with staffs, communicating effectively, counseling and mentoring subordinates, training management and ethics.
Preq: ML 3020. *Coreq:* ML 4011.

ML 4011 Organizational Leadership I Laboratory 0 (4)
Non-credit laboratory to accompany ML 4010.
Coreq: ML 4010.

ML 4020 Organizational Leadership II 4 (2)
Continuation of ML 4010. Focuses on the continued study of moral, ethical, and legal issues faced by leaders. Includes instruction in administrative and logistical management. Requires students to apply their knowledge individually and collectively to solve problems and improve the organization.
Preq: ML 4010. *Coreq:* ML 4021.

ML 4021 Organizational Leadership II Laboratory 0 (4)
Non-credit laboratory to accompany ML 4020.
Coreq: 4020.

ML 4510 Organizational Leadership III 3 (2)
Transitional leadership development and training for completion cadets and others designed to enhance practical experiences in managing organizational training programs, develop leadership skills by serving in cadet staff positions, develop small group decision making and conflict management skills, and reinforce physical fitness and lifestyle skills required of leaders. May be repeated for a maximum of six credits.
Preq: ML 3020. *Coreq:* ML 4511.

ML 4511 Organizational Leadership III Laboratory 0 (3)
Non-credit laboratory to accompany ML 4510.
Coreq: ML 4510.

MATERIALS SCIENCE AND ENGINEERING

Professors: J.M. Ballato, R.K. Bordia, D.A. Brosnan, S.H. Foulger, K.G. Kornev, G.C. Lickfield, I.A. Luzinov, M.W. Urban; *Associate Professors:* K.S. Brinkman, P.J. Brown, M.S. Kennedy, O.T. Mefford; *Assistant Professors:* L.G. Jacobsohn, F. Peng; *Joint Appointment:* V.Y.M. Blouin; *Lecturer:* D.K. Lickfield, E.C. Skaar, K.A. Stevens

MSE 1010 Materials Technology in Everyday Life 3 (3)
Introduces principles of materials science benefiting citizens. Students learn how to make intelligent choices about everyday materials and devices and present their informed opinions through class discussion and group projects involving controversial topics such as recycling, green manufacturing, and nanotechnology.

MSE 2010 Yarn Structures and Formation 4 (3)
Study of fiber processing systems required to transform various fibrous materials into yarn. Involves the machine principles and theories, relationship of the fibers to the process and the resultant yarn structures, and subsequent analysis of the yarn structure to define quality and to determine suitable manufacturing practices.
Preq: MSE 2500. *Coreq:* MSE 2011.

MSE 2011 Yarn Structures and Formation Laboratory 0 (3)
Non-credit laboratory to accompany MSE 2010. *Coreq:* MSE 2010.

MSE 2020 Fabric Structures, Design, and Analysis 4 (3)
Study of fabric formation techniques designed to explore the principles and theories of modern technology. Evaluation and analysis of weaving, knitting, and nonwoven fabrication of textile structures.
Preq: MSE 2010. *Coreq:* MSE 2021.

- MSE 2021 Fabric Structures, Design, and Analysis Laboratory 0 (3)** Non-credit laboratory to accompany MSE 2020. *Coreq:* MSE 2020.
- MSE 2100 Introduction to Materials Science 3 (3)** Introductory course in materials science designed primarily for engineering students. Studies the relation between the electrical, mechanical, and thermal properties of products and the structure and composition of these products. All levels of structure are considered from gross structures easily visible to the eye through electronic structure of atoms. *Preq:* CH 1010 with a C or better. *Preq or concurrent enrollment:* MATH 1080.
- MSE 2410 Metrics Laboratory 1 (3)** Provides basic knowledge of statistical techniques and testing procedures used to evaluate materials. Includes sampling procedures, calculation of averages, confidence intervals, Weibull statistics, precision and accuracy to enable quality decision making. *Preq or concurrent enrollment:* MSE 2100.
- MSE 2500 Polymer and Fiber Materials I 3 (3)** Introduction to the broad fields of textile, fiber, and polymer science and engineering with emphasis on the scientific, technological, and business principles utilized in producing fibers, yarns, and fabrics; enhancing fabric functionality by dyeing, finishing, and printing; and establishing end-use products.
- MSE 2510 Materials Science and Engineering Portfolio I 1 (1)** Introduces students to the concept of self-paced professional development throughout their plans of study. Each student is assigned a faculty member to act as mentor and advisor. *Preq:* Consent of instructor.
- MSE 3000 Honors Seminar 1 (1)** Acquaints students enrolled in the Departmental Honors Program with current research issues in the profession. This assists students in preparing a research proposal for the Senior Thesis. To be taken Pass/No Pass only. *Preq:* Junior standing and admission to departmental honors program.
- MSE 3030 Textile Chemistry 3 (3)** Study of the properties and reactions of aliphatic and aromatic organic compounds. Emphasizes mechanistic interpretations and the development of synthetic schemes leading to polyfunctional compounds of the types encountered in the textile industry. *Preq:* CH 1020. *Preq or concurrent enrollment:* MATH 2060 or MATH 2070.
- MSE 3190 Materials Processing I 3 (3)** Introduction into the principles underlying the processing/manufacturing of ceramic, polymeric, and metallic materials. *Preq or concurrent enrollment:* MSE 2100.
- MSE 3240 Statistics for Materials Science and Engineering 3 (3)** Introduction to statistics with particular application to the material industry. Covers measures of central value and variation, probability, the normal curve, tests of hypotheses, elementary correlation, and regression. *Preq:* Sophomore standing.
- MSE 3260 Thermodynamics of Materials 3 (3)** Introduction to physical laws that govern the equilibrium products of chemical and thermal reactions. Covers the three laws of thermodynamics, phase equilibria, energy requirements for reactions, material corrosion, and environmental stability. *Preq:* CH 1020 and MSE 2100 and MATH 1080 and PHYS 2210.
- MSE 3270 Transport Phenomena 3 (3)** Kinetic aspects of mass, heat, and fluid transport as they relate to the processing and performance of materials. *Preq or concurrent enrollment:* MSE 2100 and MSE 3260 and MATH 2080.
- MSE 3280 Phase Diagrams for Materials Processing and Applications 3 (3)** Teaches students to use single component, binary, and ternary phase diagrams to analyze material processing routes and utilization. Considers reaction pathways by which material microstructure evolves and the relationship of reaction pathway to equilibrium phase diagrams. Also considers material interactions/degradation during use. *Preq:* CH 3310 or MSE 3260.
- MSE 3420 Structure/Property Laboratory 2 (6)** Provides a basic understanding of how microstructure interrelationships and processes affect the physical properties of materials and how environmental effects modify structure and mechanical behavior of materials. *Preq:* MSE 2410.
- MSE 3610 Processing of Metals and Their Composites 3 (3)** Examines the control of microstructure-property relationships in metallic materials and their composites through development and selection of innovative manufacturing methods. *Preq or concurrent enrollment:* MSE 3270.
- MSE 3950 Honors Research I 3 (9)** Individual research under the direction of a Ceramic and Materials Engineering faculty member. *Preq or concurrent enrollment:* MSE 3270.
- MSE 4020* Solid State Materials 3 (3)** Discussion of the properties of solids as related to structure and bonding with emphasis on electronic materials. Band structure theory, electronic, and optical properties are treated. *Preq:* CH 3310 or MSE 3260; and MATH 2080; and PHYS 2210.
- MSE 4070 Senior Capstone Design 3 (1)** Work with industrial partners who have materials-related processes or product problems. Emphasizes interdisciplinary team approach and global perspective of products and problems. Incorporates critical thinking, group effectiveness, and problem solving with materials and processes. Collaborative efforts between industry and student academic teams are employed. *Preq:* IE 3840. *Coreq:* MSE 4071.
- MSE 4071 Senior Capstone Design Laboratory 0 (6)** Non-credit laboratory to accompany MSE 4070. *Coreq:* MSE 4070.
- MSE 4130* Noncrystalline Materials 3 (3)** Study of the fundamentals of the noncrystalline state. Includes cooling kinetics and effects on formation as well as physical properties of noncrystalline substances in metallic, polymeric, and ceramic systems. *Preq:* MSE 3260. *Preq or concurrent enrollment:* MSE 4020.
- MSE 4150* Introduction to Polymer Science and Engineering 3 (3)** Chemistry of monomers and polymers and the chemical and physical properties of polymers are discussed emphasizing fiber forming, synthetic polymers. Includes molecular characterization, structure, morphology, and mechanical properties as they relate to the design of polymer systems for end uses in textiles, geotextiles, plastics and fiber-reinforced composite materials. Includes Honors sections. *Preq:* CH 2010 or CH 2240.
- MSE 4160* Electrical Properties of Materials 3 (3)** Covers a range of topics dealing with electrical and magnetic materials, including metal and polymer conductors, insulators, ceramic and polymer materials for dielectric applications, and ferroelectric, piezoelectric, pyroelectric, and electrooptic materials. Metal and ceramic magnetic materials are also discussed.
- MSE 4220* Mechanical Behavior of Materials 3 (3)** Covers the microstructural basis of deformation and fracture in ceramic, metallic, and polymeric systems. *Preq:* CE 2010 and MATH 2080.
- MSE 4240* Optical Materials and Their Applications 3 (3)** Introduces the interaction of materials with light. Specific topics include fundamental optical properties, materials synthesis, optical fiber and planar waveguides, and the componentry and systems-level aspects of optical communication systems. *Preq:* MSE 4020 and MSE 4130.
- MSE 4320 Manufacturing Processes and Systems 3 (3)** Plant layout and design for manufacturing of ceramic products. Emphasizes process control and verification of processing results. Includes adaptation of computers in process simulation/robotics and the use of programmable logic controllers and robotics in processing. *Preq:* MSE 3260.
- MSE 4330 Combustion Systems and Environmental Emissions 3 (3)** Study of the application of burners, burner controls, firing atmospheres, hydrocarbon fuels, and other energy resources to industrial kilns, furnaces, and firing operations. Topics include energy resources, fuel chemistry, combustion analysis, ratio control systems, flow and pressure measurement and control, kiln atmosphere controls, industrial burners, and flames. *Preq:* MSE 3260.
- MSE 4410 Manufacturing Laboratory 1 (3)** Provides students with the understanding of process optimization. Emphasizes the use of complex experimental design schemes to elucidate the interrelationships between processing, microstructural development, and resulting properties. *Preq:* MSE 3420.
- MSE 4450 Practice of Materials Engineering 1 (1)** Students working in groups present and discuss practical, ethical, safety, business, and selected technical topics. Invited speakers discuss various aspects of the engineering world. To be taken Pass/No Pass only. *Preq:* Senior standing.
- MSE 4500 Materials Science and Engineering Portfolio 2 (2)** Students working in groups present and discuss practical, ethical, safety, and business topics in the polymer and textile industries. Students are required to complete their electronic portfolios. To be taken Pass/No Pass only.
- MSE 4510 Materials Science and Engineering Portfolio II 1 (1)** Student continues self-paced professional development throughout the rest of his/her plan of study by working with the faculty member assigned to act as mentor and advisor. *Preq:* MSE 2510 and consent of instructor.
- MSE 4550 Polymer and Fiber Laboratory 1 (3)** High molecular weight polymers are prepared from monomers, and their chemical and physical properties are measured as functions of critical end use parameters using instrumental and physical methods. *Preq or concurrent enrollment:* MSE 4150.

- MSE 4560* Polymer and Fiber Materials II 3 (2)** Chemicals used in the preparation of fabric for dyeing and finishing. Oxidizing and reducing agents and their control and effect on various fibers. Colloidal and surface active properties of various compounds and the fundamental factors influencing these properties. *Preq:* MSE 4150. *Coreq:* MSE 4561.
- MSE 4561* Polymer and Fiber Science II Laboratory 0 (2)** Non-credit laboratory to accompany MSE 4560. *Coreq:* MSE 4560.
- MSE 4570* Color Science 3 (3)** Understanding of physical, chemical, and mechanical principles behind the application of colors and finishes to textiles. Requires an appreciation of fiber chemistry and morphology, dye and finish structures and reactivity and mechanical principles behind equipment used to effect transfer of these chemicals onto the textile substrate. Includes Honors sections.
- MSE 4580* Surface Phenomena in Materials Science and Engineering 3 (3)** Introduction to surface phenomena focusing on fiber science. Fundamentals of interfacial phenomena embrace thermodynamics of surfaces, physics of adhesion, wetting, and finishing emphasizing specific features associated with interactions of liquids and chemicals with fibers and fibrous materials. *Preq:* Junior standing in engineering or science.
- MSE 4590 Color Science Laboratory 1 (3)** Introduction to common dyeing and printing methods and to some of the machinery necessary to carry out dyeing operations. *Preq or concurrent enrollment:* MSE 4570.
- MSE 4600 Surface Phenomena in Materials Science and Engineering Laboratory 1 (3)** Covers finishing in addition to dyeing operations and their instrumental control. *Preq or concurrent enrollment:* MSE 4580.
- MSE 4610 Polymer and Fiber Materials III 3 (2)** Familiarizes students with the physical properties of textile and high performance fibers and how these properties influence process and end-use performance; method of measuring those properties; and how those properties are related to structural features of the fiber. Includes Honors sections. *Coreq:* MSE 4611.
- MSE 4611 Polymer and Fiber Materials III Laboratory 0 (2)** Non-credit laboratory to accompany MSE 4610. *Coreq:* MSE 4610.
- MSE 4620* Properties of Textile Structures 3 (2)** Yarn and fabric properties, their scientific significance and analysis. Dimensional, structural, and mechanical interrelationships are established and evaluated. *Coreq:* 4621.
- MSE 4621* Properties of Textile Structures Laboratory 0 (2)** Non-credit laboratory to accompany MSE 4620. *Coreq:* MSE 4620.
- MSE 4640* Nonwoven Structures 3 (2)** Nonwoven fabric structures, their manufacture, properties, and applications. Methods of nonwoven fabric formation, resultant material characteristics and end-use applications are examined. *Preq:* MSE 2010. *Coreq:* MSE 4641.
- MSE 4641* Nonwoven Structures Laboratory 0 (2)** Non-credit laboratory to accompany MSE 4640. *Coreq:* MSE 4640.
- MSE 4900* Selected Topics in Materials Science and Engineering 1-3 (1-3)** Study of topics not ordinarily covered in other courses. Taught as the need arises. Typical topics could include current research in a specific area or technological advances. May be repeated for a maximum of six credits, but only if different topics are covered. Includes Honors sections.
- MSE 4910 Undergraduate Research 1-3 (2-6)** Investigation of a typical materials science and engineering research problem under the direct supervision of a faculty member. After completing the research, students prepare a formal written and oral report. May be repeated for a maximum of six credits. *Preq:* Consent of instructor.
- MSE 4950 Honors Research II 3 (9)** Individual research under the direction of a Ceramic and Materials Engineering faculty member. *Preq:* MSE 3950.
- MSE 4970 Honors Thesis 1 (1)** Preparation of honors thesis based on research conducted in MSE 3950 and 4950. *Preq:* MSE 4950.
- MUSIC**
- Professors:* P.L. Buyer, L. Dzuris, L.U. Harder, L.L. Li-Bleuel; *Associate Professors:* N.M. Hosler, A.R. Levin, M. Spede, B.A. Whisler; *Assistant Professor:* J. Durham; *Lecturers:* M.T. Anderson, H.D. Bannister Jr., I. Bracchitta, L.L. Browder, D. Conley, M.S. Craig, J.T. Daugherty, S.M. Fischer, C. Goodloe, T. Hurlburt, E. Jacobi, R. Jacobus, L.F. Kibler, D.R. Kirkpatrick, E. Lapin, L. Odom, L.K. Pyle, D.E. Stevenson, L.T. Warlick, P. Warneck
- MUSC 1010 Beginning Class Piano 1 (2)** Thorough introduction to basic keyboard skills including solo and ensemble repertoire, technique, applied keyboard theory, and performance. Applied music fee is assessed.
- MUSC 1020 Intermediate Class Piano 1 (2)** Continued work on keyboard skills, applied keyboard theory, solo and ensemble repertoire, and performance. Applied music fee is assessed. *Preq:* MUSC 1010.
- MUSC 1110 Beginning Class Guitar 1 (2)** Introduction to basic guitar skills, including finger-style technique, strumming, and song accompaniment. Students develop skills and appreciation of the discipline through teacher-led drills, ensemble playing, and the exploration of guitar history, style, and the impact of various players and composers on the medium. Applied music fee is assessed.
- MUSC 1120 Intermediate Class Guitar 1 (2)** Continued work on guitar skills, including finger-style, strumming, pick playing, ensemble playing, and soloing. Also includes music theory for guitarists such as keys, scales, and chord building, as well as discussions of the impact of various players and composers on the medium. Applied music fee is assessed. *Preq:* MUSC 1110.
- MUSC 1210 Beginning Class Voice 1 (2)** Introduction to basic vocal skills, including breathing, tone production, diction, intonation, and interpretation. Includes solo and ensemble repertoire. In-class group and individual performances are required. Applied music fee is assessed.
- MUSC 1420 Music Theory I 3 (3)** Introduces the materials of music theory, including notation, scales, keys, intervals, basic rhythms, and meter, triads and seventh chords, chord inversions, and non-chord tones. *Coreq:* MUSC 1430.
- MUSC 1430 Aural Skills I 1 (2)** Beginning aural skills, which include Solfege, singing and identifying intervals and scales, identifying triads and seventh chords, sight singing simple melodies in major and minor keys, and taking dictation of simple melodies in major and minor keys. *Coreq:* MUSC 1420.
- MUSC 1440 Music Theory II 3 (3)** Continuation of MUSC 1420 with added emphasis on part writing, small and larger formal structures, and secondary functions and modulation, in both classical and popular genres. *Preq:* MUSC 1420. *Coreq:* MUSC 1450.
- MUSC 1450 Aural Skills II 1 (2)** Continuation of MUSC 1430 with added emphasis on sight singing and taking dictation with more complex intervals and in various modes. *Preq:* MUSC 1430. *Coreq:* MUSC 1440.
- MUSC 1510 Applied Music 1 (1)** Individual study in performance medium (piano, voice, strings, woodwinds, brass, percussion, guitar, organ, or carillon). One 30-minute lesson each week, for which a minimum of four hours practice is required. May be repeated for credit with departmental approval of differing performance media. Applied music fee is assessed. *Preq:* Consent of instructor, based upon a qualifying audition.
- MUSC 1520 Applied Music 1 (1)** Continuation of MUSC 1510. May be repeated for credit with departmental approval of differing performance media. Applied music fee is assessed. *Preq:* MUSC 1510 and consent of instructor.
- MUSC 1530 Applied Music for Majors 1 (1)** Individual study in vocal or instrumental performance (voice, woodwinds, brass, strings, percussion or keyboards). One 45-minute lesson each week. Jury required. May be repeated for credit with departmental approval of differing performance media. Applied music fee is assessed. *Preq:* Performing Arts major (Music Concentration) and consent of instructor, based upon qualifying audition.
- MUSC 1540 Applied Music for Majors 1 (1)** Continuation of MUSC 1530. Jury and performance on a recital are required. May be repeated for credit with departmental approval of differing performance media. Applied music fee is assessed. *Preq:* MUSC 1530 and consent of instructor.
- MUSC 1800 Introduction to Music Technology 3 (2)** Introduction to music notation, sequencing, digital audio, sound reinforcement, analog and digital recording, and other current music technologies. *Preq:* Production Studies in Performing Arts major. *Coreq:* MUSC 1801.
- MUSC 1801 Introduction to Music Technology Laboratory 0 (3)** Non-credit laboratory to accompany MUSC 1800. *Coreq:* MUSC 1800.

- MUSC 1950 Creative Inquiry—Music 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Prq:* Consent of instructor.
- MUSC 2100 Music Appreciation: Music in the Western World 3 (3)** Deepens students' appreciation of their musical heritage through study of the elements of the musical language and its development in Western culture. Includes Honors sections.
- MUSC 2420 Music Theory III 3 (3)** Continuation of MUSC 1440, focusing on late 19th- and 20th-century and early 21st-century techniques. *Prq:* MUSC 1440. *Coreq:* MUSC 2430.
- MUSC 2430 Aural Skills III 1 (2)** Continuation of MUSC 1450, with the addition of harmonic dictation in inversions, melodic/harmonic dictation, and the identification of formal structures through listening. *Prq:* MUSC 1450. *Coreq:* MUSC 2420.
- MUSC 2510 Applied Music 1 (1)** Continuation of MUSC 1520. Applied music fee is assessed. *Prq:* MUSC 1520 and consent of instructor.
- MUSC 2520 Applied Music 1 (1)** Continuation of MUSC 2510. May be repeated for credit with departmental approval of differing performance media. Applied music fee is assessed. *Prq:* MUSC 2510 and consent of instructor.
- MUSC 2530 Applied Music for Majors 1 (1)** Continuation of MUSC 1540. May be repeated for credit on other performance media with departmental approval. Jury is required. Applied music fee is assessed. *Prq:* MUSC 1540 and consent of instructor.
- MUSC 2540 Applied Music for Majors 1 (1)** Continuation of MUSC 2530. May be repeated on other performance media with departmental approval. Jury and performance on a recital are required. Applied music fee is assessed. *Prq:* MUSC 2530 and consent of instructor.
- MUSC 2950 Creative Inquiry—Music 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Prq:* Consent of instructor.
- MUSC (THEA) 3080 Survey of Broadway Musicals I 3 (3)** Introduction to Broadway musical repertoire from the Golden Age of Broadway: 1943–1964. Emphasizes the music with attention to production detail, historical perspective, and social milieu. May also be offered as THEA 3080.
- MUSC (THEA) 3090 Survey of Broadway Musicals II 3 (3)** Survey of Broadway musical repertoire from new conceptual shows from 1965 to the present day. Emphasizes the music with attention to production detail, historical perspective, and social milieu. May also be offered as THEA 3090.
- MUSC 3110 History of American Music 3 (3)** Music in America from 1620 to the present. Indigenous and borrowed influences are examined.
- MUSC 3120 History of Jazz 3 (3)** Comprehensive survey of jazz elements and styles. A historical perspective from Dixieland to bebop to jazz/rock is included.
- MUSC 3130 History of Rock and Roll 3 (3)** Comprehensive survey of rock elements, styles, and artists. Emphasizes the evolution of rock and roll including a broad examination of musical influences. Course content examines how rock and roll both reflected and influenced social issues.
- MUSC 3140 World Music 3 (3)** Introduction to ethnomusicology and music of the world's peoples. Emphasis is placed on music through culture.
- MUSC 3170 History of Country Music 3 (3)** Chronological study of country music origins, styles, and artists. Emphasizes the evolution of country music from a cultural expression of the South to a commercial art form of worldwide appeal.
- MUSC 3180 History of Audio Technology 3 (3)** Surveys the historical development of audio technology and its social impacts and consequences. Technologies include automatic instruments, recording devices, radio, amplification, consumer listening devices, and distribution formats.
- MUSC 3230 Piano Accompanying I 1 (3)** Group study in piano accompanying. Focuses on sight-reading and choral, vocal, and instrumental accompanying. Students take group lessons and accompany choral groups and/or applied music students.
- MUSC 3250 CU Carillonneurs 1 (2)** Group study in playing the 47-bell University carillon. One two-hour meeting each week for which a minimum of two hours of individual practice is required. Participation in a recital is required. Students are expected to have musical keyboard experience.
- MUSC (THEA) 3290 Musical Theatre Vocal Performance 3 (2)** Trains singer-actors in musical theatre repertoire. A study of repertoire via master classes, individual instruction, research of the historical context of Broadway music, studio performance, observation, and peer evaluation, culminating in a public showcase performance. May also be offered as THEA 3290. *Coreq:* MUSC 3291.
- MUSC (THEA) 3291 Musical Theatre Vocal Performance Laboratory 0 (2)** Non-credit laboratory to accompany MUSC 3290. May also be offered as THEA 3291. *Coreq:* MUSC 3290.
- MUSC 3300 Small Ensemble 1 (3)** Ensembles: devoted to the musical training of instrumental, vocal ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Enrollment in simultaneous sections is allowed.
- MUSC 3310 Pep Band 1 (3)** Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given in addition to the minimum rehearsal time. Simultaneous enrollment in multiple sections is allowed. Audition required.
- MUSC 3320 Woodwind Quintet 1 (3)** Ensembles: advanced study of woodwind chamber music media. One one-hour class meeting each week, for which a minimum of two hours of ensemble practice is required. Audition required. *Prq or concurrent enrollment:* MUSC 3620.
- MUSC 3330 String Quartet 1 (3)** Ensembles: advanced study of string quartet repertoire. Two 90-minute meetings each week for which a minimum of two hours of practice is required. Audition required. *Prq or concurrent enrollment:* MUSC 3690.
- MUSC 3340 Flute Choir 1 (3)** Ensembles: study of flute ensemble literature. One 60-minute meeting each week for which a minimum of two hours of practice is required. Audition required.
- MUSC 3360 Percussion Ensemble 1 (2)** Ensembles: study and performance of percussion ensemble literature. One two-hour class meeting each week, for which a minimum of two hours of individual practice is required. Audition required. *Prq or concurrent enrollment:* MUSC 3310 or MUSC 3620 or MUSC 3630 or MUSC 3640 or MUSC 3690.
- MUSC 3370 Steel Drum Band 1 (2)** Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given in addition to the minimum rehearsal time. Rehearsals also include discussions of steel band history and performance practice. Audition required.
- MUSC 3410 Men's Breakout Ensemble 1 (2)** Small ensembles: study of male a cappella/popular music on an advanced level. Audition required. *Prq or concurrent enrollment:* MUSC 3700 or MUSC 3720.
- MUSC 3420 Women's Breakout Ensemble 1 (2)** Small ensembles: study of women's a cappella/popular vocal music on an advanced level. Audition required. This course may be repeated for credit with a maximum of 16 hours ensemble credit allowable toward a degree. *Prq or concurrent enrollment:* MUSC 3700 or MUSC 3710.
- MUSC 3430 Men's Small Ensemble 1 (2)** Small ensembles: study of male a cappella/popular, barbershop, and nostalgic music on an advanced level. *Prq or concurrent enrollment:* MUSC 3700 or MUSC 3720.
- MUSC 3440 Vocal Jazz Ensemble 1 (3)** Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. *Prq or concurrent enrollment:* MUSC 3700 or MUSC 3710 or MUSC 3720.
- MUSC 3510 Applied Music 1 (1)** Continuation of MUSC 2520. May be repeated for credit with departmental approval of differing performance media. Applied music fee is assessed. *Prq:* MUSC 2520 and consent of instructor.
- MUSC 3520 Applied Music 1 (1)** Continuation of MUSC 3510. Students are required to perform an appropriate solo in a student recital. May be repeated for credit with departmental approval of differing performance media. Applied music fee is assessed. *Prq:* MUSC 3510 and consent of instructor.
- MUSC 3530 Applied Music for Majors 1 (1)** Continuation of MUSC 2540. May be repeated on other performance media with departmental approval. Jury is required. Applied music fee is assessed. *Prq:* MUSC 2540 and consent of instructor.

MUSC 3540 Applied Music for Majors 1 (1) Continuation of MUSC 3530. May be repeated on other performance media with departmental approval. Juried half-recital performance is required. Applied music fee is assessed. *Preq:* MUSC 3530 and consent of instructor.

MUSC 3610 Marching Band 1 (3) Ensembles: devoted to musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Offered fall semester only. This course may be repeated for credit with a maximum of 16 hours ensemble credit allowable toward a degree.

MUSC 3620 Symphonic Band 1 (3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Audition required. This course may be repeated for credit with a maximum of 16 hours ensemble credit allowable toward a degree.

MUSC 3630 Jazz Ensemble 1 (3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Audition required. This course may be repeated for credit with a maximum of 16 hours ensemble credit allowable toward a degree.

MUSC 3640 Concert Band 1 (2) Devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. This course may be repeated for credit with a maximum of 16 hours ensemble credit allowable toward a degree.

MUSC 3690 Symphony Orchestra 1 (3) College-community orchestra devoted to performing works from the standard repertoire. Public performances are given periodically in addition to the minimum rehearsal time. Audition required. This course may be repeated for credit with a maximum of 16 hours ensemble credit allowable toward a degree.

MUSC 3700 Clemson University Singers 1 (3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Audition required. This course may be repeated for credit with a maximum of 16 hours ensemble credit allowable toward a degree.

MUSC 3710 Women's Chorus 1 (3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given in addition to the minimum rehearsal time. This course may be repeated for credit with a maximum of 16 hours ensemble credit allowable toward a degree.

MUSC 3720 Men's Chorus 1 (3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given in addition to the minimum rehearsal time. This course may be repeated for credit with a maximum of 16 hours ensemble credit allowable toward a degree.

MUSC 3950 Creative Inquiry—Music 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of instructor.

MUSC 3980 Special Topics in Music 3 (3) Consideration of select areas of study in music not addressed by other music courses. May be repeated once for credit.

MUSC 4000* Music in the Elementary Classroom 3 (3) Familiarizes teachers in the elementary classroom with traditional, Kodaly, Orff, and Kindermusik approaches in correlating music with language arts, mathematics, and social studies.

MUSC 4050 Instrumental and Vocal Arranging 3 (2) Advanced study of the properties of instruments and voices and their combination in various small and large ensembles. Emphasis is placed on applying this knowledge to the creation of instrumental and vocal arrangements. *Preq:* MUSC 1800 and MUSC 1420. *Coreq:* MUSC 4051.

MUSC 4051 Instrumental and Vocal Arranging Laboratory 0 (3) Non-credit laboratory to accompany MUSC 4050. *Coreq:* MUSC 4050.

MUSC 4150 Music History to 1750 3 (3) Development of Western music from antiquity to 1750, emphasizing representative literature from various styles and periods. Music ensemble and/or lesson experience is recommended.

MUSC 4160 Music History Since 1750 3 (3) Development of Western music from 1750 to the present, emphasizing representative literature from various styles and periods. Music ensemble and/or lesson experience is recommended.

MUSC 4300 Conducting 3 (3) Study of choral and instrumental conducting. Emphasis is on manual conducting techniques, attitudes, philosophies, and responsibilities necessary for the preparation, planning, and execution of artistic conducting. *Preq:* MUSC 1420.

MUSC 4510 Applied Music 1 (1) Continuation of MUSC 3520, guiding students in interpretation of advanced solo and ensemble literature. Students are required to perform an appropriate solo in a student recital. May be repeated for credit with departmental approval of differing performance media. Applied music fee is assessed. *Preq:* MUSC 3520 and consent of instructor.

MUSC 4520 Applied Music 1 (1) Continuation of MUSC 4510. Students are required to perform an appropriate solo in a student recital. Applied music fee is assessed. *Preq:* MUSC 4510 and consent of instructor.

MUSC 4530 Applied Music for Majors 1 (1) Continuation of MUSC 3540. May be repeated on other performance media with departmental approval. Jury is required. Applied music fee is assessed. *Preq:* MUSC 3540 and consent of instructor.

MUSC 4540 Applied Music for Majors 1 (1) Continuation of MUSC 4530. May be repeated on other performance media with departmental approval. Juried full recital performance is required. Applied music fee is assessed. *Preq:* MUSC 4530 and consent of instructor.

MUSC 4950 Creative Inquiry—Music 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of instructor.

MUSC 4990 Independent Studies 1-3 (1-3) Tutorial work for students with special interests in music study outside the scope of existing courses. May be repeated for a maximum of six credits. *Preq:* Consent of department chair.

NONPROFIT LEADERSHIP

NPL 3000 Foundations in Nonprofit Leadership 3 (3) Course provides foundational knowledge and understanding of non-profit organizations, their development, governance, maintenance and operations within modern society. NPL courses may not substitute for courses in Accounting, Economics, Executive Leadership & Entrepreneurship, Finance, Management, or Marketing curricula.

NPL 3010 Understanding Stakeholders for Non-Profit Organizations 3 (3) Comprehensive review of identifying and reaching stakeholders in non-profit organizations. Material covers basic promotion of non-profit services, including use of media through advertising, public service announcements, events and partnerships, as well as approaches to copy writing, public speaking and working with local and regional governments. NPL courses may not substitute for courses in Accounting, Economics, Executive Leadership & Entrepreneurship, Finance, Management, or Marketing curricula. *Preq:* NPL 3000.

NPL 3020 Funding and Accountability in Non-Profit Organizations 3 (3) This course prepares students to understand and participate in the fiscal management of non-profit organizations. Course focuses on understanding, producing, interpreting, and communicating financial information to staff, board members, volunteers and other stakeholders. NPL courses may not substitute for courses in Accounting, Economics, Executive Leadership & Entrepreneurship, Finance, Management, or Marketing curricula. *Preq:* NPL 3000.

NPL 3030 Personnel Leadership in Non-Profit Organizations 3 (3) Introduces students to the principles of personnel leadership as related to paid, un-paid and seasonal employees of non-profit organizations. Recruitment, selection/hiring, retention and motivation, and evaluation as it pertains to the non-profit sector and its unique blend of paid and un-paid workers is discussed. NPL courses may not substitute for courses in Accounting, Economics, Executive Leadership & Entrepreneurship, Finance, Management, or Marketing curricula. *Preq:* NPL 3000.

NPL 3040 Risk Management of Non-Profit Organizations 3 (3) Conceptual and practical aspects of risk management and legal issues associated with non-profit organizations are covered. Foundational knowledge of the non-profit organization as a legal entity, including risk identification, management, transfer and financing, liability, and ethics. NPL courses may not substitute for courses in Accounting, Economics, Executive Leadership & Entrepreneurship, Finance, Management, or Marketing curricula. *Preq:* NPL 3000.

NPL 3900 Practicum I 1 (3) Under agency supervision, students spend 60 hours observing and implementing activities, events, and programs in a nonprofit, faith-based, grassroots, or organization approved by instructor. To be taken Pass/No Pass only. *Preq:* NPL 3000.

NPL 4900 Non-Profit Leadership Preceptorship 3 (9) Provides students with the opportunity to gain practical experience in an environment where learning about non-profit operations and management is the chief objective. Under the guidance of a qualified professional supervisor, students apply theories, concepts, philosophies and techniques acquired in the classroom. To maximize the student's professional development, the practicum is to encompass as many operation and management aspects of the cooperating agency as possible. To be taken Pass/No Pass only. NPL courses may not substitute for courses in Accounting, Economics, Executive Leadership & Entrepreneurship, Finance, Management, or Marketing curricula. *Preq:* NPL 3000.

NURSING

Professors: J.N. Eggert, B.J. Holaday, V.G. Parker, R.H. Pruitt, *Director;* D.F. Willoughby; *Associate Professors:* S.C. Davis, A.E. Johnson, N.K. Meehan, S.M. Timmons, M.A. Wetsel; *Assistant Professors:* R. Amerson, J.M. DeLuca, L.M. Duggan, T.K. Fasolino, C.M. Hernandez, J.J. Whitcomb; *Instructors:* H.S. Temples, S.S. Webster; *Lecturers:* P.A. Botchway, T. Busby, N.R. Ewing, J.S. Gillespie, J.G. Lanham, K.L. Massa, C.S. Murton, A.K. Pye, K.J. Smith, J. Vess, L. Wagner

NURS 1020 Nursing Success Skills 2 (2) Introduction to a variety of topics critical to a student's success as a Nursing major and future professional. Topics include time management, goal setting, test taking, campus and nursing department resources and policies, critical thinking, and diversity. Students have the opportunity to discover and practice many procedures, techniques, and tips, as well as apply principles learned to their future career in nursing. *Preq:* Nursing major.

NURS 1400 Computer Applications in Nursing 3 (3) Introduces students to nursing and the application of computer technology in the delivery of health care. Covers existing computer health-care applications, emerging trends and forecast future needs. Social and ethical issues related to technology are discussed. *Preq:* Acceptance into the Nursing program.

NURS 1980 Creative Inquiry—Nursing 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.

NURS 2980 Creative Inquiry—Nursing 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.

NURS 3000 Seminar in Health Care Topics 1-4 (1-4) Individualized in-depth study in a selected health care area; may have a clinical component and/or special projects. Open to non-Nursing majors. May be repeated for a maximum of six credits. *Preq:* Consent of instructor.

NURS 3030 Medical-Surgical II: Nursing of Adults 7 (3) Incorporates theoretical and empirical knowledge from physical and social sciences. Uses critical thinking to provide holistic, safe, individualized nursing care to adults, including health promotion, maintenance, restoration, and health teaching. *Preq:* NURS 3040 and NURS 3100 and NURS 3120 and NURS 3400. *Coreq:* NURS 3031 and NURS 3050.

NURS 3031 Medical-Surgical II: Nursing of Adults Laboratory 0 (12) Non-credit laboratory to accompany NURS 3030. *Coreq:* NURS 3030.

NURS 3040 Pathophysiology for Health Care Professionals 3 (3) Focuses on disease mechanisms and recognition of the manifestations of these mechanisms in body systems. Discussion also includes pharmacologic and mechanical interventions commonly associated with specific disease processes and application to patient-care situations. *Preq:* BIOL 2230 with a C or better and junior standing in Nursing.

NURS 3050 Psychosocial Nursing 3 (3) Lifespan approach to examine psychosocial, developmental, family, and cultural factors that influence individuals from diverse populations and their families in the promotion, maintenance, and restoration of health. The use of the nursing process, critical thinking, therapeutic communication, and psychosocial nursing interventions is explored. *Coreq:* NURS 3030.

NURS 3070 Family Nursing in the Community 4 (3) Bridge course for registered nurse students that focuses on nursing care of families across the lifespan in the context of the community. Major emphasis is on practice activities to assist individuals in achieving or maintaining wellness in the family, home, and community environments. *Coreq:* NURS 3071 and NURS 4250.

NURS 3071 Family Nursing in the Community Laboratory 0 (2) Non-credit laboratory to accompany NURS 3070. *Coreq:* NURS 3070.

NURS 3100 Health Assessment 3 (2) Introduces concepts of health, wellness, and illness. Focuses on physical, psychosocial, and cultural assessment for the well adult client with variations across the lifespan. Includes interviewing techniques. *Coreq:* NURS 3101 and NURS 3120 and NURS 3400.

NURS 3101 Health Assessment Laboratory 0 (3) Non-credit laboratory to accompany NURS 3100. *Coreq:* NURS 3100.

NURS 3110 Health Promotion Across the Lifespan 2 (2) Focuses on health promotion and illness prevention activities across the lifespan for individuals and families in the community. Major emphasis is on nursing's role in the acquisition and maintenance of health as well as the identification and modification of health risk factors. *Preq:* NURS 3100 and NURS 3120 and NURS 3200.

NURS 3120 Medical-Surgical I: Foundations of Nursing 4 (2) Focuses on therapeutic nursing interventions, including selected psychomotor skills, communication skills, and teaching/learning. *Coreq:* NURS 3100 and NURS 3120 and NURS 3400.

NURS 3121 Medical-Surgical I: Foundations of Nursing Laboratory 0 (6) Non-credit laboratory to accompany NURS 3120. *Coreq:* NURS 3120.

NURS 3180 Multidisciplinary Approach to End-of-Life Care 3 (3) Integrates principles of care to increase comfort at the end of life, presented within a framework that encompasses the physical, psychosocial, and spiritual dimensions of an individual. Coursework also includes ethical and legal issues related to advance directives, reimbursement, and regulatory topics. *Preq:* PSYC 2010 or SOC 2010.

NURS 3190 Health Assessment for RNs 3 (3) Expands knowledge of health assessment techniques utilized with well or ill adult clients. Emphasizes data collection as a basis for critical thinking in professional nursing practice. *Preq:* Admission to RN/BS program.

NURS 3200 Professionalism in Nursing 3 (3) Application of critical thinking skills is the core of professional nursing roles in multidisciplinary approaches to health care. Analysis of the historical development of modern nursing. Examination of issues of providing nursing care to diverse populations within the context of professional standards. Includes medical nomenclature. *Preq:* BIOL 2220.

NURS 3230 Gerontology Nursing 2 (2) Introduction of theories of aging. Focuses on complex health care issues of aging and chronic care, including promotion, maintenance, and restoration of health of the elderly. Scientific concepts address physiological, psychological, and sociological issues of aging and chronic illness. *Preq:* NURS 3100 and NURS 3120.

NURS 3280 Honors Seminar I 2 (2) Serves as the foundation for senior honors projects. Students identify a topic of interest, a faculty mentor, and team members for their honors project and begin to review the literature in their areas of interest. *Preq:* Admission to Nursing Department Honors program.

- NURS 3300 Research in Nursing 3 (3)** Introduction to conceptual frameworks, models, and theories related to nursing. Analysis of reported research in nursing and related disciplines. Ethical, moral, and legal issues are discussed in relation to nursing research. Includes Honors sections. *Preq:* NURS 3100 and NURS 3120 and NURS 3200; or admission to the RN/BS or accelerated Nursing program.
- NURS (HCG) 3330 Health Care Genetics 3 (3)** Focuses on the new genetics and the implications for health care professionals. Discussion includes applications of the evolving genetics technology and services to changing life stages. Issues of ethics relevant to various genetic disorders is also addressed. May also be offered as HCG 3330. *Preq:* BIOL 2220.
- NURS 3340 Integrative Healing: Complementary/Alternative Healthcare 3 (3)** Introduction to healing practices that are complementary with/and alternative (C/A) for conventional Western medicine. Includes exploration of research, principles, techniques, and methods of C/A used in health and healing.
- NURS 3400 Pharmacotherapeutic Nursing Interventions 3 (3)** Focuses on the integration of nursing process with pharmacotherapeutics, administration, monitoring, and related client education. Includes major drug classifications, indications for use, side effects, interactions, routes of administration, usual dosages and contraindications. *Preq:* Junior standing in Nursing. *Coreq:* NURS 3100 and NURS 3120.
- NURS 3510 Contemporary Health Care Ethics 3 (3)** Students from diverse disciplines use knowledge of ethical theories/principles to critically reflect on current health care issues and policies. Students also examine methods of ethical decision making to conduct policy analysis. Current trends in the political, economic and legal arenas of health care are examined using the Socratic Method. Nursing majors are given registration priority.
- NURS 3600 Social Determinants of Health in Low Resource Countries 3 (3)** Examines the historic roots of global health and the impact of social determinants of health with specific focus on low resource countries. Topics include diseases common to impoverished populations, childhood and maternal morbidity, violence, occupational injuries, and malnutrition. *Preq:* Nursing, Public Health Sciences, Nutrition, Preprofessional Health Studies, Preoccupational Therapy, Prepharmacy, Prephysical Therapy, or Prephysician Assistant major.
- NURS 3610 Leadership and Collaboration in Global Health 3 (3)** Provides the foundation for leadership skills and collaboration for the delivery of global health care in low resource countries. Development of communication skills needed to work in collective, partnership-based agencies and communities as part of an inter-professional team is emphasized. *Preq:* Enrollment in Health Science, Language and International Health, Nursing, Nutrition and Dietetics, Prepharmacy, Prerehabilitation Sciences, or Preprofessional Health program.
- NURS 3620 Low Resource Country Field Experience 3 (9)** In this study abroad course, students focus on language acquisition while working and living in a low resource country. Students participate in service-learning projects with community partnerships. Emphasis is placed on recognition of the social, economic and cultural contexts of the host country. *Preq:* Enrollment in Health Science, Language and International Health, Nursing, Nutrition and Dietetics, Prepharmacy, Prerehabilitation Sciences, or Preprofessional Health program.
- NURS 3980 Creative Inquiry—Nursing 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.
- NURS 4010 Mental Health Nursing 5 (3)** Application of theories and the nursing process to identify, implement, and evaluate nursing interventions for the care of clients with psychiatric disorders. *Preq:* NURS 3030 and NURS 3050 and NURS 3110 and NURS 3230 and NURS 3300. *Coreq:* NURS 4011 and NURS 4110 and NURS 4120.
- NURS 4011 Mental Health Nursing Laboratory 0 (6)** Non-credit laboratory to accompany NURS 4010. *Coreq:* NURS 4010.
- NURS 4030 Medical-Surgical III: Complex Nursing of Adults 5 (3)** Focuses on the biological, psychological, philosophical, and sociocultural influences on complex health problems related to acute and traumatic conditions. Emphasizes the concepts of circulation, oxygenation, homeostasis, and compensation in acutely ill adults. *Preq:* NURS 4010 and NURS 4110 and NURS 4120. *Coreq:* NURS 4031.
- NURS 4031 Medical-Surgical III: Complex Nursing of Adults Laboratory 0 (6)** Non-credit laboratory to accompany NURS 4030. *Coreq:* NURS 4030.
- NURS 4050 Leadership and Management in Nursing 3 (2)** Focuses on the role of the professional nurse in managing nursing care. Theories and research related to leadership, power, management, organizations, regulation, and ethics are discussed. Directed laboratory experiences are provided. *Preq:* Admission to RN/BS program. *Coreq:* NURS 4051.
- NURS 4051 Leadership and Management in Nursing Laboratory 0 (2)** Non-credit laboratory to accompany NURS 4050. *Coreq:* NURS 4050.
- NURS 4060 Issues in Professionalism 3 (3)** Analysis of the development of professional nursing. Consideration of educational issues, legal and economic issues, health policy, leadership, cultural variations, and the influence of values in ethical decisions and nursing practice. *Preq:* Admission to RN/BS program.
- NURS 4100 Leadership Management and Nursing Care Practicum 6 (3)** Focuses on the role of the professional nurse in practicing and managing nursing care. Theories and research related to clinical practice, leadership, power, management, organizations, regulation, ethics, and licensure preparation are discussed. Directed lab experiences are provided under preceptor supervision. *Coreq:* NURS 4030 and NURS 4100.
- NURS 4101 Leadership Management and Nursing Care Practicum Laboratory 0 (9)** Non-credit laboratory to accompany NURS 4100. *Coreq:* NURS 4100.
- NURS 4110 Nursing Care of Children 5 (3)** Focuses on child health problems and health maintenance. Emphasizes biological, pathophysiological, psychological, and sociocultural concepts related to nursing care of children with acute, critical, and chronic illnesses. Includes strategies for alleviation of illnesses, restoration of wellness, promotion and maintenance of health, growth, and development. *Preq:* NURS 3030 and NURS 3050 and NURS 3110 and NURS 3230 and NURS 3300. *Coreq:* NURS 4010 and NURS 4111.
- NURS 4111 Nursing Care of Children Laboratory 0 (6)** Non-credit laboratory to accompany NURS 4110. *Coreq:* NURS 4110.
- NURS 4120 Nursing Care of Women and Their Families 5 (3)** Emphasizes biological, psychological, and sociocultural concepts; identification of appropriate nursing strategies to enhance individual capacity to achieve or maintain wellness in the family, home, community, and hospital environment. *Preq:* NURS 3030 and NURS 3050 and NURS 3110 and NURS 3230 and NURS 3300. *Coreq:* NURS 4010 and NURS 4121.
- NURS 4121 Nursing Care of Women and Their Families Laboratory 0 (6)** Non-credit laboratory to accompany NURS 4120. *Coreq:* NURS 4120.
- NURS 4140 Community Health Nursing and Health Promotion 5 (3)** Focuses on community health nursing of families and community groups, including community assessment, screening, health promotion and health education, with emphasis on the health of clients and population groups in homes, schools, industries and other community agencies and organizations. *Preq:* NURS 4010 and NURS 4110 and NURS 4120 and admission to the accelerated Nursing program. *Coreq:* NURS 4141.
- NURS 4141 Community Health Nursing and Health Promotion Laboratory 0 (6)** Non-credit laboratory to accompany NURS 4140. *Coreq:* NURS 4140.
- NURS 4150 Community Health Nursing 4 (2)** Consideration of health promotion activities for family and community groups with emphasis on community assessment, screening, and health teaching/counseling. Practice activities are related to health promotion in population groups and nursing care of homebound clients. Laboratory settings include homes, schools, industries, and other community organizations. *Preq:* NURS 4010 and NURS 4110 and NURS 4120. *Coreq:* NURS 4151.
- NURS 4151 Community Health Nursing Laboratory 0 (6)** Non-credit laboratory to accompany NURS 4150. *Coreq:* NURS 4150.
- NURS 4160 Concepts in Transcultural Nursing 3 (3)** Focuses on transcultural nursing concepts, theory and practices in order to provide culturally congruent nursing care. Culture care beliefs, values and practices of specific cultures are analyzed based on Leininger's Culture Care Theory, using the ethnonursing method and research findings.
- NURS 4200 Senior Honors I 2 (2)** Students develop a proposal for a major thesis, directed study project, or research project under the guidance of a faculty preceptor. *Preq:* Honors section of NURS 3300.

NURS 4250 Community Nursing 4 (3)

Consideration of health promotion activities for groups within the community with emphasis on community assessment, screening, and health teaching/counseling. Practice activities are related to health promotion in population groups and nursing care of homebound clients. Laboratory settings include homes, schools, industries, public health department, and other community agencies. *Preq:* Admission to RN/BS program. *Coreq:* NURS 3070 and NURS 4251.

NURS 4251 Community Nursing Laboratory 0 (2)

Non-credit laboratory to accompany NURS 4250. *Coreq:* NURS 4250.

NURS 4280 Senior Honors II 2 (2)

Students implement a proposal for a major directed study project or research thesis under the guidance of a faculty preceptor. *Preq:* NURS 4200.

NURS 4980 Creative Inquiry—Nursing 1-4 (1-4)

In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.

NURS 4990 Independent Study 1-4 (1-4)

In-depth study in an area of special interest in Nursing. Students develop specific objectives with a faculty member with expertise in the area of interest. May be repeated for a maximum of six credits. *Preq:* Consent of instructor.

NUTRITION

See also courses listed under Animal and Veterinary Sciences, Biochemistry, and Food Science.

Professors: A.B. Bodine II, K.L. Cason, T.C. Jenkins, D.V. Maurice; *Associate Professors:* M.D. Condrasky, A.M. Fraser, V.J. Haley-Zitlin; *Assistant Professor:* E.D. Jesch; *Senior Lecturer:* R.M. Haliena; *Adjunct Assistant Professor:* S.S. Baker, M.A. Parisi

NUTR 2030 Introduction to Principles of Human Nutrition 3 (3)

Study of nutrient functions and requirements, food choices, dietary adequacy, and role of nutrition in physical fitness. Deals with social and scientific issues; evaluation and interpretation of nutrition sources from government, private, academic, and the health care sectors.

NUTR 2040 Nutrition Across the Life Cycle 3 (3)

Using current evidence, course examines nutrition issues and requirements across the life cycle, including pre-conception, pregnancy, lactation, infancy, childhood, adolescence, adulthood, and aging. Methods of nutritional assessment for each stage of life are explored. *Preq:* NUTR 2030.

NUTR 2050 Nutrition for Nursing Professionals 3 (3)

Investigation of targeted general and clinical nutrition topics, including principles of nutrition, life-cycle nutrition, relationship of diet to health and disease, and the role of nursing professionals and nutrition. *Preq:* Nursing major. *Preq or concurrent enrollment:* BIOL 2220.

NUTR 2100 Nutrition and Physical Activity 3 (3)

Topics include role of carbohydrates, fats, and proteins on energy utilization during exercise; altering body composition and improving fitness with diet and physical activity; importance of fluid intake on performance; effectiveness of dietary supplements and ergogenic aids; and choosing a diet appropriate for individual physical activity levels. *Preq:* BIOL 1200; and one of BIOL 1210 or BIOL 1220 or BIOL 1230 or BIOL 1240.

NUTR 2160 Evidence-Based Nutrition 1 (1)

Introduction to research methods, ethics in research, and evidence-based nutrition guidelines within the profession of nutrition and dietetics. *Preq:* Food Science major.

NUTR 4010* Fundamentals of Nutrition 3 (3)

Biochemical and physiological fundamentals of nutrition applicable to man and domestic animals. Considers digestive processes and absorption and metabolism of carbohydrates, lipids, proteins, water, minerals, and vitamins. Discusses energy metabolism and comparative anatomy and physiology of digestive systems. Offered fall semester only. Includes Honors sections. *Preq:* BCHM 3050 or CH 2230.

NUTR 4180 Professional Development in Dietetics 1 (1)

Provides the steps for dietetic internship application process; career development in the dietetics field; and concepts of professional standards. *Preq:* Food Science major and Junior standing.

NUTR 4190 Professional Development in Nutrition 1 (1)

Career development strategies to assist students pursuing professional or graduate degrees. The focus is on standards used for admission, application preparation, and what to do when admitted. *Preq:* Food Science major and Junior standing.

NUTR 4200 Selected Topics in Nutrition 1-3 (1-3)

Comprehensive study of special topics in nutrition not covered in detail or contained in other courses. Current developments in each area are stressed. May be repeated for a maximum of three credits, but only if different topics are covered. *Preq:* Food Science major and Senior standing.

NUTR 4210 Special Problems in Nutrition 1-4 (1-4)

Independent research investigation in nutrition. Special emphasis is on developing a research proposal, conducting the research, and reporting the findings. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Food Science major and Senior standing.

NUTR 4240* Medical Nutrition Therapy I 4 (3)

Principles of nutritional assessment, education, and counseling skills; development of medical nutrition therapy for individuals with obesity and eating disorders, gastrointestinal disorders, metabolic and renal disorders. *Preq:* Food Science major or minor; and BIOL 2220 and BIOL 2230 and NUTR 4510. *Coreq:* NUTR 4241.

NUTR 4241* Medical Nutrition Therapy I Laboratory 0 (3)

Non-credit laboratory to accompany NUTR 4240. *Coreq:* NUTR 4240.

NUTR 4250* Medical Nutrition Therapy II 4 (3)

Development of medical nutrition therapy for individuals with various disease states, including cardiovascular, hepatic, musculoskeletal, and neoplastic disorders. Also considers sociocultural and ethnic aspects of food consumption and alternative nutrition therapies. Includes Honors sections. *Preq:* Food Science major or minor; and BIOL 2220 and BIOL 2230 and NUTR 4240. *Coreq:* NUTR 4251.

NUTR 4251* Medical Nutrition Therapy II Laboratory 0 (3)

Non-credit laboratory to accompany NUTR 4250. *Coreq:* NUTR 4250.

NUTR 4260* Community Nutrition 3 (3)

Study of fundamentals of nutrition care delivery in community programs beginning with assessment and problem identification and continuing through the development, implementation, and evaluation of nutrition intervention programs. *Preq:* Food Science major or minor and NUTR 4510.

NUTR 4270 Nutrition Counseling 1 (1)

Examination and application of nutrition counseling methods, theories and strategies needed to promote nutrition behavior change. Assessment and interpretation of client information, development of client goals, and evaluation of interventions are discussed. *Preq:* NUTR 4240.

NUTR 4510* Human Nutrition 3 (3)

Advanced concepts of nutrition, including physiological handling of nutrients, nutrient-nutrient interactions, and principles of nutritional deficiency and over-nutrition. Factors affecting methods of determining nutritional status, development of nutrition standards, and recent advances in human nutrition. *Preq:* Food Science major or minor. *Preq or concurrent enrollment:* BCHM 3050.

NUTR 4550* Nutrition and Metabolism 3 (3)

Concepts of metabolism fundamental to understanding normal and therapeutic nutrition are examined. Bioenergetics as well as metabolism of carbohydrates, lipids, amino acids, vitamins, and minerals as they relate to nutrition are discussed. *Preq:* Food Science major or minor; and BCHM 3050 and BIOL 2220. *Preq or concurrent enrollment:* BIOL 2230.

PERFORMING ARTS

Professors: P.L. Buyer, L. Dzuris, L.U. Harder, D.J. Hartmann, *Chair;* *Associate Professors:* N.M. Hosler, A.M. Penna, S. Robert, B.A. Whisler; *Senior Lecturer:* K.W. Moore

PA 1010 Introduction to Performing Arts 3 (3)

Overview of performing arts, including performance, careers, technology, production, management, community outreach, safety, sales, and marketing. *Preq:* Production Studies in Performing Arts major. *Coreq:* PA 1030.

PA 1030 Portfolio I 1 (3)

Students develop discipline-specific portfolios that display creative design and contain samples of work that demonstrate integrated learning. *Coreq:* PA 1010.

PA 1950 Creative Inquiry—Performing Arts 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of instructor.

PA 2010 Career Planning and Professional Development 3 (2) Study of selected performing arts topics. Includes seminars and masterclasses with faculty and visiting artists and concert and theatre attendance and evaluation. Emphasis is placed on written communication skills. *Preq:* PA 1010 and Sophomore standing. *Coreq:* PA 2011.

PA 2011 Career Planning and Professional Development Laboratory 0 (3) Non-credit laboratory to accompany PA 2010. *Coreq:* PA 2010.

PA 2790 Performing Arts Practicum I 1 (3) Practical work on performing arts presentations including backstage technical work, multimedia support, and arts management.

PA 2800 Performing Arts Practicum II 1 (3) Continuation of practical work on performing arts presentations, with more specialized opportunities for backstage technical work, multimedia support, and arts management training. *Preq:* PA 2790.

PA 2950 Creative Inquiry—Performing Arts 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of instructor.

PA 3010 Principles of Arts Administration 3 (2) Continuation of PA 2010 with added focus on critical and ethical analysis of performing arts. Emphasis is placed on oral communication skills. *Preq:* PA 2010 and Junior standing. *Coreq:* PA 3011.

PA 3011 Principles of Arts Administration Laboratory 0 (3) Non-credit laboratory to accompany PA 3010. *Coreq:* PA 3010.

PA 3950 Creative Inquiry—Performing Arts 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of instructor.

PA 3980 Special Topics in Performing Arts 1-3 (1-3) Select areas of study in performing arts not addressed by other performing arts course offerings. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* PA 1010 and consent of instructor.

PA 3990 Internship 1-3 (1-3) Provides performing Arts majors an opportunity to apply technical, managerial, and artistic concepts in a performing arts environment through preplanned, preapproved, faculty-supervised internships. Minimum of 45 hours of work per credit hour. May be repeated for a maximum of six credits. To be taken Pass/No Pass only. *Preq:* PA 2790 and consent of instructor.

PA 4010 Capstone Project 4 (3) Capstone course for Performing Arts majors. Students research, prepare, execute and assess a substantial project for the community as approved by a faculty committee. Students, with faculty guidance, manage all aspects of the project. *Preq:* PA 3010. *Coreq:* PA 4011 and PA 4030.

PA 4011 Capstone Project Laboratory 0 (3) Non-credit laboratory to accompany PA 4010. *Coreq:* PA 4010.

PA 4030 Portfolio II 1 (3) Students revise discipline-specific portfolios through use of current technologies. Further demonstration of integrated learning is provided with the incorporation of capstone project research content from PA 4010. *Coreq:* PA 4010.

PA 4910 Performing Arts Honors Research 3 (3) Research for the preparation of an honors project. *Preq:* PA 3010 and consent of department chair.

PA 4920 Performing Arts Honors Project 3 (3) Preparation and presentation of an honors project. *Preq:* PA 4910 and consent of department chair.

PA 4950 Creative Inquiry—Performing Arts 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of instructor.

PA 4990 Independent Studies 1-3 (1-3) Supervised study for students with special interests in performing arts outside the scope of existing courses. May be repeated for a maximum of six credits. *Preq:* Consent of department chair.

PAN AFRICAN STUDIES

Associate Professor: A. A. Bartley

PAS 1010 Africa and the Atlantic World 3 (3) Study of Africa and its impact on the culture and life of peoples in the New World. Traces the impact Africans have had on shaping the music, language, dress, art, religion, and culture of the Western world.

PAS 3010 Introduction to Pan African Studies 3 (3) Study of African American experience from an Afrocentric perspective from colonial America to the present.

PAS 4000 Studies in Pan African Studies 3 (3) Study of selected topics or themes in Pan African Studies. Allows for individualized study of specific topics related to Pan African Studies such as music, dance, religion, colonization, slavery, or economic development. May be repeated for a maximum of six credits, but only if different topics are covered.

PAS 4100 Studies in Africana Experience 3 (3) Looks at the impact of Africans or African Americans on U.S. society. Interdisciplinary course that allows for the study of Africans and their descendants from a variety of perspectives. Focuses primarily on the United States. May be repeated for a maximum of six credits, but only if different topics are covered.

PAS 4300 Hip-Hop and African American Contemporary Culture 3 (3) Examines the controversial history and legacy of Hip-Hop culture, and explores how the artistic expression of the American underclass has evolved into worldwide cultural expression. Combines scholarship and theory with considerable audio and video exposure to various Hip-Hop songs and artists. *Preq:* Sophomore standing.

PAS 4680 Comparative Racism and Discrimination in the Atlantic World 3 (3) Seminar in the comparative history of racism and segregation in South Africa and the Americas. *Preq:* Sophomore standing.

PAS 4710 Directed Studies on the Black Experience in Education 1-3 (1-3) Students conduct research and produce scholarship on academic, social, and historical issues that impact the Black experience in educational settings. Students may also participate in service learning activities to broaden their understanding and apply their knowledge in the community. May be repeated for a maximum of nine credits.

PAS 4980* Seminar on Pan African Studies 3 (3) Research/writing seminar on the African American experience. Selected topics and themes from 1900 to present. *Preq:* PAS 3010; and one of HIST 3110 or HIST 3120 or HIST 3390.

PEARCE CENTER FOR PROFESSIONAL COMMUNICATION

PCPC 4990 Pearce Center Internship 1-3 (1-3) Students work in the Class of 1941 Studio for Student Communication on projects involving multimodal communications, public relations, graphic design, and publishing. Students edit copy, pitch stories, research and write articles for print, web, and/or video publication, create ePubs, develop and execute social media strategies, design marketing material, develop public relations strategies, design websites, and other related tasks. *Preq:* Consent of instructor.

PLANT AND ENVIRONMENTAL SCIENCES

Professors: H. Liu, T. Whitwell, G. Zehnder, P. Zungoli;
Associate Professors: P. Agudelo, J. Andrae, K. Gasic, E. Mikhailova, D. Park, N. Tharayil

PES 1040 Introduction to Plant Sciences 3 (3) Fundamental course in plant sciences, including agronomic and horticultural crops of the major agricultural areas of the world and emphasizing the crops of South Carolina. Includes Honors sections.

PES 2020 Soils 4 (3) Introduces world land resources, soil formation, classification, and mineralogy. Emphasizes basic chemical and physical properties of soil. Also discusses soil microorganisms, plant nutrients, and fertilization. Soil properties are related to growth. *Preq:* CH 1010 or CH 1020 or GEOL 1010. *Coreq:* PES 2021.

PES 2021 Soils Laboratory 0 (2) Non-credit laboratory to accompany PES 2020. *Coreq:* PES 2020.

- PES (ENSP) 3150 Environment and Agriculture 3 (3)** Survey of the interrelationships of the environment and current agriculture and agricultural practices to include both the environmental impacts of agriculture and the role of agriculture in conservation and improving the environment. Includes Honors sections. May also be offered as ENSP 3150. *Preq:* Sophomore standing and one of the following combinations: BIOL 1040 and BIOL 1060; or BIOL 1100 and BIOL 1110; or CH 1010 and CH 1020; or CH 1050 and CH 1060.
- PES 3350 Agricultural Biotechnology 3 (2)** Strategies for the best use of biotechnology and genetic resources to alleviate constraints in global hunger, environmental sustainability, and health. Includes genetic enhancement and chromosome engineering of plant, animal, and microbial systems; issues related to commercial implementation; the impact on developing countries, environmental impact, and governmental policies. *Preq:* GEN 3000. *Coreq:* PES 3351.
- PES 3351 Agricultural Biotechnology Laboratory 0 (2)** Non-credit laboratory to accompany PES 3350. *Coreq:* PES 3350.
- PES (BIOL) 3400 Medical Botany 3 (3)** Study of use of compounds of plant and fungal origin as poisons, hallucinogens, and pharmaceuticals. May also be offered as BIOL 3400. *Preq:* BIOL 1040 and BIOL 1060 and CH 1020.
- PES 3500 Practicum 1-6 (1-6)** Preplanned practical or research experience related to student-selected Plant and Environmental Sciences concentration. Practicum is undertaken with an approved advisor or agency. May be repeated for a maximum of six credits. *Preq:* Plant and Environmental Sciences major.
- PES 4010 Academic and Professional Development 1 (1)** Students work with Career Center staff and the instructor to develop interview skills, resumes and professional goals, as well as identify skills necessary to be competitive. The importance of ethics in science careers is discussed.
- PES 4030* Soil Genesis and Classification 2 (1)** Study of soil morphology and characterization, pedogenic processes, soil-forming factors, and classification of soils. Offered fall semester only. *Preq:* PES 2020. *Coreq:* PES 4031.
- PES 4031* Soil Genesis and Classification Laboratory 0 (3)** Non-credit laboratory to accompany PES 4030. *Coreq:* PES 4030.
- PES 4050* Plant Breeding 3 (3)** Application of genetic principles to the development of improved crop plants. Principal topics include the genetic and cytogenetic basis of plant breeding, mode of reproduction, techniques in selfing and crossing, methods of breeding, inheritance in the major crops, and biometrical methods. Offered spring semester only. *Preq:* GEN 3000. *Coreq:* PES 4051.
- PES 4051* Plant Breeding Laboratory 0 (2)** Non-credit laboratory to accompany PES 4050. *Coreq:* PES 4050.
- PES 4060* Special Problems 1-3 (1-3)** Acquaints students with the scientific method. Literature investigation, planning, and execution of an experiment are integral parts of the course. Not open to students who have taken or are taking PES 4910 and PES 4920. May be repeated for a maximum of six credits. *Preq:* Senior standing.
- PES (BE) 4080* Land Treatment of Wastewater and Sludges 3 (3)** Principles for designing environmentally acceptable land application systems using municipal and industrial wastewater and sludges are presented. Topics include land-limiting constituent analysis; soil-plant interactions; system equipment and design; system operation and management; public acceptance, social, and regulatory issues. Case studies and field trips are planned. May also be offered as BE 4080. *Preq:* Senior standing.
- PES 4090* Biology of Invasive Plants 3 (3)** Introductory course covering mechanisms of plant invasions. Emphasizes unique traits that confer invasiveness and/or weediness to plants, and how these plant traits interact with the environment to facilitate invasion of agricultural lands, forests, rangelands and less-managed landscapes. Covers various cultural, chemical and biological control aspects. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 3040.
- PES 4210* Principles of Field Crop Production 3 (3)** Principles for production of field crops. Topics include botany and physiology, tillage, harvesting, storage, and crop quality. Principles are illustrated using examples from various crops. *Preq:* PES 2020 and PES 1040.
- PES 4220* Major World Crops 3 (3)** Examines the distribution, adaptation, production, and utilization of major agronomic crops of the world. Emphasizes crops important to U.S. agriculture. Specific crops discussed in more detail include corn, wheat, rice, sorghum, soybeans, cotton, tobacco, and peanuts. *Preq:* PES 2020 and PES 1040.
- PES 4230* Field Crops—Forages 3 (3)** Establishment, management, and utilization of forage crops in a forage-livestock agroecosystem context. Discusses hay, silage, and pasture utilization. Uses computer models to study complexity of forage-livestock production systems. Includes Honors sections. *Preq:* PES 1040 or PES 2020.
- PES (AGRB) 4260* Cropping Systems Analysis 3 (2)** Application of agronomic and economic principles in solving problems related to the production and marketing of agronomic crops. Major part of the course is a case study in which detailed analysis of a farm, agribusiness, or environmental situation is made with students making formal written and oral presentations of results. May also be offered as AGRB 4260. *Preq:* PES 1040; and Junior standing; and AGRB 2020 or ECON 2000 or ECON 2110. *Coreq:* PES 4261.
- PES (AGRB) 4261* Cropping Systems Analysis Laboratory 0 (2)** Non-credit laboratory to accompany PES 4260. May also be offered as AGRB 4261. *Coreq:* PES 4260.
- PES (HORT) 4330* Landscape and Turf Weed Management 3 (2)** Weed management strategies that include cultural, biological, and chemical methods are studied for landscape and turfgrass areas. Problem-solving skills and herbicide characteristics are emphasized. May also be offered as HORT 4330. *Coreq:* PES 4331.
- PES (HORT) 4331* Landscape and Turf Weed Management Laboratory 0 (2)** Non-credit laboratory to accompany PES 4330. May also be offered as HORT 4331. *Coreq:* PES 4330.
- PES 4450* Regulatory Issues and Policies 2 (2)** Introduction to regulations of plant agriculture. Emphasizes risk assessment, patenting biotechnology inventions, and ethical issues. Includes survey of state and governmental agencies with responsibilities to avoid risk to humans, non-target organisms, and preservation of food safety, agricultural resources, and natural ecosystems.
- PES 4460* Soil Management 3 (3)** Basic soil properties are related to compaction, water and solute movement, and root growth. Considers practical management problems and develops solutions based on basic soil characteristics. Problems include erosion, no-tillage, compaction, irrigation, leaching, waste application, golf green management, and orchard establishment. *Preq:* PES 2020.
- PES 4510* Agricultural Biotechnology and Global Society 1 (1)** In-depth discussion of recent articles on agricultural biotechnology and related global issues. Includes independent and comprehensive literature survey and critical discussions on implementation of biotechnology products in the context of world agricultural production systems and economics. Discusses the role of international agencies and social and ethical issues.
- PES 4520* Soil Fertility and Management 3 (3)** Study of soil properties, climatic factors, and management systems in relation to soil fertility maintenance for crop production. Considers plant nutrition and growth in relation to crop fertilization and management. *Preq:* PES 2020.
- PES 4530* Soil Fertility Laboratory 1 (3)** Evaluation and interpretation of soil fertility production. Includes Honors sections. *Preq:* PES 2020.
- PES 4550 Seminar 1 (1)** Presentation of interdisciplinary topics and original research in agronomy, entomology, plant pathology, soils, and related sciences.
- PES (ETOX, GEOL) 4850* Environmental Soil Chemistry 3 (3)** Study of soil chemical processes (sorption, desorption, ion exchange, precipitation, dissolution, and redox reactions) of nutrients and inorganic and organic contaminants in soils and organic matter. Chemical complex equilibria and adsorption phenomena at the solid (soil, sediment, and mineral) water interface are emphasized. May also be offered as ETOX 4850 or GEOL 4850. *Preq:* CH 1020 or PES 2020.
- PES 4900* Beneficial Soil Organisms in Plant Growth 3 (3)** Aspects of biological nitrogen fixation, mycorrhizal fungi, microbial-pesticide interactions, bioremediation, nutrient cycles, and biological pest control related to plant growth, soil/environmental quality; and sustainable agriculture are covered. Students who desire laboratory experience in these topics may register for PES 4060 after consultation with instructor. *Preq:* PES 2020 and either MICR 3050 or PLPA 3100.
- PES 4910 Senior Honors Research 3 (1)** Senior division honors research in an agricultural sciences curriculum. In consultation with and under the direction of a professor, students select a research topic, conduct experiments, record data, and make oral presentations of results to the College Honors Program Committee. Open to approved Honors Program students only. *Coreq:* PES 4911.

PES 4911 Senior Honors Research Laboratory 0 (6) Non-credit laboratory to accompany PES 4910. *Coreq:* PES 4910.

PES 4920 Senior Honors Research 3 (1) Continuation of PES 4910. Senior division honors research in an agricultural sciences curriculum. Upon termination of the research project, students submit formal written reports and make final oral presentations of results to the College Honors Program Committee. Professor-student discussions of additional topics are arranged. *Coreq:* PES 4921.

PES 4921 Senior Honors Research Laboratory 0 (6) Non-credit laboratory to accompany PES 4920. *Coreq:* PES 4920.

PES (ENT) 4960 Selected Topics in Creative Inquiry 1-2 (1-2) Disciplinary and multidisciplinary projects with the goal of developing the student's ability to discover, analyze, evaluate, and present data. Students are required to document their activities in their ePortfolios. May be repeated for a maximum of six credits. May also be offered as ENT 4960. *Preq:* Consent of instructor.

PES (ENT) 4970 Selected Topics in Creative Inquiry Laboratory 1-2 (1-2) Disciplinary and multidisciplinary research project with the goal of developing the student's ability to conduct research along with analysis, evaluation and presentation of results. Students are required to document their research activities in their ePortfolios. May be repeated for a maximum of six credits. May also be offered as ENT 4970. *Preq:* Consent of instructor.

PHILOSOPHY

Professors: W.A. Maker, *Chair*; T.G. May, D.E. Wueste; *Associate Professors:* C.M. Grau, D. Perpich, S.A. Sarris, K.C. Smith, C.B. Starkey; *Assistant Professor:* C.C. Delmas; *Lecturers:* M. Hannen, A.W. Garnar, J. Ingle, G. Moss, R. Lake, D.L. Stegall

PHIL 1010 Introduction to Philosophic Problems 3 (3) Discussion of representative philosophical questions that arise from human thought and action. Characteristic topics are values, knowledge, human nature, and society. Includes Honors sections.

PHIL 1020 Introduction to Logic 3 (3) Introduction to methods of evaluating arguments. Gives simple valid argument forms, which can be joined together to produce the logical form of virtually any argument. Informal fallacies may also be considered. Includes Honors sections.

PHIL 1030 Introduction to Ethics 3 (3) Philosophical consideration of the nature of ethics, basic ethical issues, and problems and modes of ethical reasoning. Includes Honors sections.

PHIL 1050 Introductory Seminar in the Big Questions 3 (3) Introductory seminar dealing with a single important philosophical question such as Who are we? What is the meaning of life? Are we free or determined? Question is pursued throughout the semester with active student involvement. Questions may vary from semester to semester.

PHIL 1240 Technology and Its Discontents 3 (3) Philosophical introduction to issues arising from the development of technologies, their implementation, and their integration into society. Considers theoretical questions regarding the nature of technology and its evaluation, as well as issues related to specific technologies.

PHIL 2100 Evolution and Creation 3 (3) A critical comparison of evolution and creationism. Students examine the scientific, philosophical, and theological issues this clash brings to light, develop their ability to think through the various claims and counter claims critically, and then articulate a coherent position for themselves. Credit toward a degree will be given for only one of PHIL 2100 or BIOL 2100.

PHIL 3030 Philosophy of Religion 3 (3) Critical consideration of the meaning and justification of religious beliefs. Representative topics are the nature and existence of God, religious knowledge, religious language, the problem of evil.

PHIL 3040 Moral Philosophy 3 (3) Study of moral problems, their origin in conflicts between duty and desire, and alternative solutions proposed by classical and contemporary writers.

PHIL 3050 Existentialism 3 (3) Inquiry into the core themes of existentialism: freedom, meaningfulness or meaninglessness of life, the existence of God, etc. Representative thinkers from the existentialist tradition, such as Dostoyevsky, Kierkegaard, Sartre, and de Beauvoir, are studied.

PHIL (CHIN) 3120 Philosophy in Ancient China 3 (3) Study of the history of Chinese philosophy from fifth century BCE, including Confucianism, Daoism, Moism, legalism, Buddhism, Neo-Daoism, and Neo-Confucianism. Examination of Chinese philosophers' views and arguments on questions of life and death, history and society, education and personal cultivation. May not be used to satisfy general foreign language requirements. May also be offered as CHIN 3120.

PHIL (CHIN) 3130 Philosophy in Modern China 3 (3) Study of the history of Chinese philosophy from the 19th century BCE, including Confucianism, Daoism, Moism, legalism, Buddhism, Neo-Daoism, and Neo-Confucianism. Examination of Chinese philosophers' views and arguments on questions of life and death, history and society, education and personal cultivation. May not be used to satisfy general foreign language requirements. May also be offered as CHIN 3130.

PHIL 3140 Comparative Topics in Eastern and Western Philosophy 3 (3) Study of issues and areas of overlapping concern to Eastern and Western philosophical traditions (e.g., ontology, ethics) with emphasis on both contrasts and convergences in philosophical approaches. Topics may vary.

PHIL 3150 Ancient Philosophy 3 (3) Origins and development of rationality as found in the thought of selected philosophers such as Socrates, Plato, and Aristotle.

PHIL 3160 Modern Philosophy 3 (3) Development of the modern view as seen in major Western philosophers of the 16th, 17th, and 18th centuries. Thought of Berkeley, Descartes, Hume, Leibniz, Locke, and Spinoza may be considered to illustrate the development of rationalism and empiricism.

PHIL 3170 Nineteenth-Century Philosophy 3 (3) Development of 19th-century philosophy emphasizing selected works of philosophers such as Kant, Hegel, Marx, Nietzsche, and Kierkegaard.

PHIL 3180 Twentieth-Century Philosophy 3 (3) Historical overview of selected significant movements in 20th-century Western philosophy such as Continental and/or analytic philosophy.

PHIL 3200 Social and Political Philosophy 3 (3) Critical consideration of the views of some major philosophers on the nature of the individual's relation to society and the state in the context of their wider philosophical (logical, epistemological, metaphysical, and ethical) doctrines. Philosophers may include Plato, Aristotle, Augustine, Hobbes, Rousseau, Mill, Marx, Hegel, Rawls, and Nozick.

PHIL 3210 Crime and Punishment 3 (3) Investigates what sorts of conduct should be criminalized and what society should do with those who engage in criminal activity. Specific topics may include the enforcement of morals, euthanasia, hate crimes, deterrence, retribution, and restitution.

PHIL 3230 Theory of Knowledge 3 (3) Examination of concepts, criteria, and decision procedures underlying rational belief and the justification of knowledge claims. Representative answers to the problem of skepticism are considered, with special attention to some leading theories of knowledge.

PHIL 3240 Philosophy of Technology 3 (3) Examines technology and representative philosophical assessments of it with a focus on understanding its impact on the human condition.

PHIL 3250 Philosophy of Science 3 (3) Philosophical study of problems generated by science, but that are not themselves scientific, such as what comprises a scientific theory; how scientists formulate theories and acquire knowledge; what, if anything, differentiates science from other ways of knowing; what role concepts play in scientific knowledge; whether scientific progress is rational.

PHIL 3260 Science and Values 3 (3) Examination of several features of the relation between science and values. Topics may include ethical and social obligations of scientists, role of value judgements in scientific practice, and influence of social and political values on science and scientists.

PHIL 3270 Philosophy of Social Science 3 (3) Inquiry into the philosophical foundations of social science, in particular questions of objectivity, explanatory structure, causality, agency, normativism and naturalism, and social determination of knowledge.

PHIL 3280 Philosophy and Technology of the Body 3 (3) Examines the interrelation of human bodies and emerging technologies in light of philosophical notions of human nature, personal identity, and the ethical dignity of the human. Emphasizes the influence of social values on scientific and technological developments and the reciprocal impact of these developments on understandings of the body.

PHIL 3300 Contemporary Issues in Philosophy 3 (3) Examination of a variety of issues of broad concern to philosophers today. Issues may vary. May be repeated once for credit with departmental consent.

PHIL 3330 Metaphysics 3 (3) Examination of issues and problems concerning the ultimate nature of reality. Topics may include the appearance/reality distinction, the nature of existence, freedom and determinism, personal identity, idealism, and realism.

- PHIL 3400 Technology, Environment, and Sustainability 3 (3)** Philosophical examination of how technology contributes to significant environmental change. Considers role of science in justifying claims about (for example) global climate change, role of technology in responding to these changes, how technology affects relations between humans and the extra-human world, and ethical implications of various kinds of technology.
- PHIL 3430 Philosophy of Law 3 (3)** Explanation of the nature of legal theory and the law through a critical examination of the basic concepts and principles of these fields.
- PHIL 3440 Business Ethics 3 (3)** Study of ethical issues created by business activities, relating them to fundamental questions of ethics generally. Representative topics may include hiring, firing, promotions, business and minorities, organizational influence in private lives, consumer interests, economic justice, and reindustrialization.
- PHIL 3450 Environmental Ethics 3 (3)** Study of ethical problems in our dealings with the rest of nature and of how they relate to ethics in general. Representative topics include the basis of ethics, nature and intrinsic value, duties to future generations, economics and the environment, rare species, animal rights, ethics and agriculture, energy doctrine.
- PHIL 3460 Medical Ethics 3 (3)** Examines ethical dilemmas facing modern medicine. Topics may include controversies surrounding death, reproductive technologies, abortion, allocation of resources, the concept of disease, the doctor-patient relationship, and medical research.
- PHIL 3470 Ethics in Architecture 3 (3)** Interdisciplinary course focused on the architectural profession and the practices of design, building, and other processes in a social and business context. Consideration is given to both general moral principles and particular case studies.
- PHIL 3480 Philosophies of Art 3 (3)** Examines some of the predominant attempts to understand art in ancient and modern philosophy and also considers a variety of contemporary views and controversies about the nature, meaning, value, and future of art.
- PHIL (WS) 3490 Theories of Gender and Sexuality 3 (3)** Examines the philosophical dimensions of contemporary debates about the relation of sex, gender, and sexuality. May also be offered as WS 3490.
- PHIL 3500 Technology and Philosophy in Nursing 3 (3)** Analyzes influence of increasing application of scientific technology to health care delivery and concomitant ethical issues.
- PHIL 3510 Philosophy of Emotion 3 (3)** Considers a range of classic and contemporary readings on the nature and function of emotion. Topics include cognitive, physiological, and constructionist approaches to understanding emotion, emotion and reason, emotion and morality, and select individual emotions.
- PHIL 3550 Philosophy of Mind and Cognitive Science 3 (3)** Critical examination of philosophical and scientific theories of mental phenomena and of the relationship between mental and material phenomena. Theories of Mind-Body Dualism, Monism, Functionalism, Eliminative and Reductive Materialism, Connectionism, and the status of folk psychology versus cognitive neuroscience are studied.
- PHIL 3600 Symbolic Logic 3 (3)** Introduction to the basic concepts of modern symbolic logic, including the symbolization of statements and arguments and the techniques of formal proof.
- PHIL 3700 Philosophy of War 3 (3)** Examines war from both ethical and strategic perspectives: the nature of a just war, the aims of war, and the kinds of general strategies appropriate for achieving those aims.
- PHIL 3750 Minds and Machines 3 (3)** Examines controversial questions in artificial intelligence and the Computational Theory of Mind. Topics may include: "Can machines think?" "What's involved in being able to think?" "Can machines reason, understand, be conscious, be self-aware, learn, be creative, have emotions, and use natural language?" Focus is on man-made computers and the mind as computer.
- PHIL 3990 Philosophy Portfolio 2 (2)** Creation of a digital portfolio to demonstrate competence in reasoning, critical thinking, and problem solving skills as well as ethical judgment. Course also serves as a resource for academic and professional development. *Preq:* Junior standing in Philosophy.
- PHIL 4010* Studies in the History of Philosophy 3 (3)** In-depth study of a selected philosopher, philosophical school, or movement. Topics vary. With departmental consent, may be repeated once for credit. Current topics and course descriptions are available in the department's course offering brochure.
- PHIL 4020* Topics in Philosophy 3 (3)** Thorough examination of a particular philosophical topic, issue, or problem. Topics vary. May be repeated once for credit with departmental consent. Current topics and course descriptions are available in the department's course offering brochure.
- PHIL 4220 Anarchism 3 (3)** Philosophical study of the roots of anarchist thought and its current articulations.
- PHIL 4750 Philosophy of Film 3 (3)** Pursues several issues at the center of recent debate in the philosophy of film. Questions investigated include whether film has an essence that distinguishes it from other art forms, whether films ought to be thought of as having authors or narrators, and whether films can themselves philosophize.
- PHIL 4900 Law, Liberty and Justice Prelaw Internship 1-3 (1-3)** Faculty-supervised internship designed for students in the Law, Liberty and Justice emphasis area of the Philosophy major. Interns are placed with law offices or with institutions and agencies in fields related to law and social policy. May be repeated for a maximum of six credits. To be taken Pass/No Pass only. *Preq:* Philosophy major and Junior standing and consent of internship coordinator.
- PHIL 4920 Creative Inquiry—Philosophy 1-4 (1-4)** Small group work on particular issues with emphasis on involving students in research. Content varies. May be repeated for a maximum of nine credits. *Preq:* Consent of instructor.
- PHIL 4970 Philosophy Honors Research 3 (3)** Students conduct research, clearly define the topic, and complete an annotated bibliography under the supervision of the thesis advisor. *Preq:* Consent of department chair and thesis advisor.
- PHIL 4980 Philosophy Honors Thesis 3 (3)** In consultation with the thesis advisor and committee, students write, revise, defend, and complete the thesis. *Preq:* PHIL 4970 and consent of department chair and thesis advisor.
- PHIL 4990* Independent Study 1-3 (1-3)** Course of study designed by the student in consultation with a faculty member who agrees to provide guidance, discussion, and evaluation of the project. Student must confer with the faculty member prior to registration. May be repeated for a maximum of six credits. *Preq:* Consent of instructor.

PHYSICAL SCIENCE

Lecturer: M. Nammouz

- PHSC 1070 Introduction to Earth Science 4 (3)** Survey of topics in geology, meteorology, astronomy, and oceanography, emphasizing comprehension and practical application of earth science concepts to experiments. Credit toward a degree will be given for only one of PHSC 1070 or 1170. *Coreq:* PHSC 1071.
- PHSC 1071 Introduction to Earth Science Laboratory 0 (3)** Non-credit laboratory to accompany PHSC 1070. *Coreq:* PHSC 1070.
- PHSC 1080 Introduction to Physical Science 4 (3)** Survey of topics in chemistry and physics emphasizing comprehension and practical application of physical science concepts to experiments. Credit toward a degree will be given for only one of PHSC 1080 or 1180. *Coreq:* PHSC 1081.
- PHSC 1081 Introduction to Physical Science Laboratory 0 (3)** Non-credit laboratory to accompany PHSC 1080. *Coreq:* PHSC 1080.
- PHSC 1170 Introduction to Chemistry and Earth Science for Elementary Education Majors 4 (3)** Integrates topics in chemistry, earth science and environmental science. It emphasizes the interconnections among the various science disciplines and the practical application to experiments and activities appropriate for the elementary classroom. Credit toward a degree will be given for only one of PHSC 1070 or 1170. *Preq:* Elementary Education major. *Coreq:* PHSC 1171.
- PHSC 1171 Introduction to Chemistry and Earth Science for Elementary Education Majors Laboratory 0 (3)** Non-credit laboratory to accompany PHSC 1170. *Coreq:* PHSC 1170.
- PHSC 1180 Introduction to Physics, Astronomy, and Earth Science for Elementary Education Majors 4 (3)** Integrates topics in physics, astronomy, and earth science. It emphasizes the interconnections among the various science disciplines and the practical application to experiments and activities appropriate for the elementary classroom. Credit toward a degree will be given for only one of PHSC 1080 or 1180. *Preq:* PHSC 1170. *Coreq:* PHSC 1181.

PHSC 1181 Introduction to Physics, Astronomy, and Earth Science for Elementary Education Majors Laboratory 0 (3) Non-credit laboratory to accompany PHSC 1180. *Coreq:* PHSC 1180.

PHYSICS

Professors: E. Alexov, M.S. Daw, D.H. Hartmann, J.R. King, M.F. Larsen, M.D. Leising, *Chair;* C.D. Marinescu, J.W. Meriwether, B.S. Meyer, A.M. Rao, T.M. Tritt, A. Valentini; *Associate Professors:* S. Brittain, P.J. Flower, G.A. Lehmacher, J. Oberheide, C. Sosolik, E. Takacs, S. Tewari; *Assistant Professors:* M. Ajello, F. Ding, J. He, H. Kang, J. Marler, H. Sanabria

PHYS 1010 Current Topics in Modern Physics 1 (0) Demonstrations and lectures serving as an introduction to different areas of physics and astronomy are presented by various members of the staff. May include such topics as astrophysics, energy, relativity, and weather, as well as visits to the planetarium.

PHYS 1220 Physics with Calculus I 3 (3) First of three courses in a calculus-based physics sequence. Topics include vectors, laws of motion, conservation principles, rotational motion, oscillations, and gravitation. Credit for a degree will be given for only one of PHYS 1220, 2000, or 2070. Includes Honors sections. *Preq or concurrent enrollment:* MATH 1060 or MATH 1070.

PHYS 1240 Physics Laboratory I 1 (3) Introduction to physical experimentation with emphasis on mechanical systems, including oscillatory motion and resonance. Computers are used in the experimental measurements and in the statistical treatment of data. Credit for a degree will be given for only one of PHYS 1240 or 2090. *Preq or concurrent enrollment:* PHYS 1220.

PHYS 1990 Creative Inquiry—Physics and Astronomy 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.

PHYS 2000 Introductory Physics 4 (3) Introduction to classical physics. Includes elements of mechanics, heat, electricity, and light. May not be substituted for PHYS 1220, but may be substituted for PHYS 2070 with the approval of the student's program of study department. Credit for a degree will be given for only one of PHYS 1220, 2000, or 2070. *Preq or concurrent enrollment:* MATH 1050. *Coreq:* PHYS 2001.

PHYS 2001 Introductory Physics Laboratory 0 (2) Non-credit laboratory to accompany PHYS 2000. *Coreq:* PHYS 2000.

PHYS 2070 General Physics I 3 (3) Introductory course for students who are not majoring in physical science or engineering. Covers such topics as mechanics, waves, fluids, and thermal physics. Credit for a degree will be given for only one of PHYS 1220, 2000, or 2070. *Preq or concurrent enrollment:* MATH 1020 or MATH 1040 or MATH 1050.

PHYS 2080 General Physics II 3 (3) Continuation of PHYS 2070. Covers such topics as electricity, magnetism, electromagnetic waves, optics, and modern physics. Credit for a degree will be given for only one of PHYS 2080 or 2210. *Preq:* PHYS 2070.

PHYS 2090 General Physics I Laboratory 1 (2) Introductory laboratory course for students who are not majoring in physical science or engineering. Covers such topics as mechanics, waves, fluids, and heat. Credit for a degree will be given for only one of PHYS 1240 or 2090. *Preq or concurrent enrollment:* PHYS 2070.

PHYS 2100 General Physics II Laboratory 1 (2) Covers such topics as electricity, magnetism, electromagnetic waves, optics, and modern physics. Credit for a degree will be given for only one of PHYS 2230 or 2100. *Preq:* PHYS 2070, 2090. *Preq or concurrent enrollment:* PHYS 2080.

PHYS 2210 Physics with Calculus II 3 (3) Continuation of PHYS 1220. Topics include thermodynamics, kinetic theory of gases, electric and magnetic fields, electric currents and circuits, and motions of charged particles in fields. Credit for a degree will be given for only one of PHYS 2080 or 2210. Includes Honors sections. *Preq or concurrent enrollment:* MATH 1080 or MATH 1110.

PHYS 2220 Physics with Calculus III 3 (3) Continuation of PHYS 2210. Topics include wave motion, electromagnetic waves, interference and diffraction, relativity, atomic particles, and atomic and nuclear structure. Includes Honors sections. *Preq:* PHYS 2210.

PHYS 2230 Physics Laboratory II 1 (3) Experiments in heat and thermodynamics, electrostatics, circuits, and magnetism. Computers are used in statistical treatment of data. Credit for a degree will be given for only one of PHYS 2230 or 2100. *Preq or concurrent enrollment:* MATH 1080 or MATH 1110.

PHYS 2240 Physics Laboratory III 1 (3) Experiments involve atomic, molecular, and nuclear systems. Wave particle dualism of light and matter is emphasized. Calculators and computers are used in statistical treatment of data. *Preq or concurrent enrollment:* PHYS 2220.

PHYS 2400 Physics of the Weather 3 (3) Descriptive introduction to meteorology. Includes atmospheric thermodynamics, solar radiation, heat budget, atmospheric circulation, force laws governing air motion, fronts, precipitation, synoptic prediction. Special topics of current interest, such as the effect of environmental pollution on weather and the effect of weather on health, are included.

PHYS 2450 Physics of Global Climate Change 3 (3) Descriptive study of the heating and cooling balance of the Earth's atmosphere and surface and feedback mechanisms that regulate our climate. Past and future temperature trends, atmospheric greenhouse gas inventories, and solar radiative forcing. Evaluation of claims and news about climate change, and their interaction with public opinion.

PHYS 2800 Physics and Reality 3 (3) Non-technical study of the content and meaning of modern physics. Begins with first-principles of physics. Evaluates concepts of substance, matter, locomotion, atomization, fields, space, time, and randomness. Includes quantum mechanics, Bells Theorem, theory of relativity, and Godels Theorem. Intended for a broad audience, including specialists and non-specialists.

PHYS 2900 Physics Research 1-3 (1-3) Individual research project in any area of experimental or theoretical physics or astronomy supervised by a physics or astronomy faculty member. Project need not be original but must add to students' ability to carry out research. May be repeated for a maximum of six credits. Students must have a 3.0 minimum grade-point average to enroll in this course. *Preq:* Consent of instructor.

PHYS 2990 Creative Inquiry—Physics and Astronomy 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.

PHYS 3000 Introduction to Research 2 (2) Acquaints students with current research in physics. Seminars are provided where research activities in various areas of physics and astronomy are summarized. Provides a basis for students to choose a suitable topic for a senior thesis. Includes Honors sections. *Preq:* PHYS 2210.

PHYS 3110 Introduction to the Methods of Theoretical Physics 3 (3) Survey of methods and techniques of problem-solving in physics. Emphasizes the application of mathematical techniques to the solution of problems of vectors, fields, and waves in mechanics, electromagnetism, and quantum physics. *Preq:* PHYS 2220.

PHYS 3120 Methods of Theoretical Physics II 3 (3) Continuation of PHYS 3110 focused on introducing various mathematical notions widely used in upper level physics courses, such as differential equations, special functions and complex numbers, and complex functions. *Preq:* PHYS 3110.

PHYS 3150 Introduction to Computational Physics 3 (3) Basic numerical methods important for data interpretation and modeling in physics, such as interpolation, derivatives, integration, solving differential and matrix equations, and Monte Carlo simulation. Methods are applied to physics problems, including realistic projectile motion, harmonic oscillators, chaotic pendulum, nonlinear systems, and Ising model. *Preq:* PHYS 2220.

PHYS 3210 Mechanics I 3 (3) Statics, motions of particles and rigid bodies, vibratory motion, gravitation, properties of matter, flow of fluids. Includes Honors sections. *Preq:* PHYS 2210.

PHYS 3220 Mechanics II 3 (3) Dynamics of particles and rigid bodies, Lagrangian and Hamiltonian formulations, vibrations of strings, wave propagation. Includes Honors sections. *Preq:* PHYS 3210.

PHYS 3250 Experimental Physics I 3 (1) Introduction to experimental modern physics, measurement of fundamental constants, repetition of crucial experiments of modern physics (Stern-Gerlach, Zeeman effect, photoelectric effect, etc.). Includes Honors sections. *Preq or concurrent enrollment:* PHYS 2220. *Coreq:* PHYS 3251.

PHYS 3251 Experimental Physics I Laboratory 0 (4) Non-credit laboratory to accompany PHYS 3250. *Coreq:* PHYS 3250.

PHYS 3260 Experimental Physics II 3 (1) Continuation of PHYS 3250. Includes Honors sections. *Coreq:* PHYS 3261.

- PHYS 3261 Experimental Physics II Laboratory 0 (4)** Non-credit laboratory to accompany PHYS 3260. *Coreq:* PHYS 3260.
- PHYS 3550 Modern Physics 3 (3)** Study of the topics of modern physics, including relativity, atomic physics, quantum mechanics, condensed-matter physics, nuclear physics, and elementary particles. Includes Honors sections. *Preq:* PHYS 2220 and MATH 2060.
- PHYS 3560 Modern Physics Overview 1 (1)** Overview of topics in modern physics, including a short description of the structure of solids, nuclear physics, and particle physics. *Preq:* PHYS 2220.
- PHYS 3990 Creative Inquiry—Physics and Astronomy 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.
- PHYS 4010 Senior Thesis 1-3 (1-3)** Semi-original theoretical, experimental, or computational research project performed under the direction of a faculty member. Fields available include astronomy, astrophysics, atmospheric physics, biophysics, high energy physics, relativity, solid state physics, and statistical mechanics. May be repeated for a maximum of six credits. Includes Honors sections. *Preq:* Nine credits of physics at the 3000- or 4000-level.
- PHYS 4170* Introduction to Biophysics I 3 (3)** Introduction to the application of physics to biological problems. Topics include review of elementary chemical and biological principles, physics of biological molecules, and fundamentals of radiation biophysics. Includes Honors sections. *Preq:* MATH 2060 and PHYS 2210.
- PHYS 4200* Atmospheric Physics 3 (3)** Study of physical processes governing atmospheric phenomena. Topics include thermodynamics of dry and moist air, solar and terrestrial radiative processes, convection and cloud physics, precipitation processes, hydrodynamic equations of motion and large-scale motion of the atmosphere, numerical weather prediction, atmospheric electricity. *Preq:* MATH 1080; and PHYS 2080 or PHYS 2210.
- PHYS 4320* Optics 3 (3)** Covers a selection of topics, depending on the interest of the student. Topics may include the formation of images by lenses and mirrors, design of optical instruments, electromagnetic wave propagation, interference, diffraction, optical activity, lasers, and holography. Includes Honors sections. *Preq:* PHYS 2210.
- PHYS 4410* Electromagnetics I 3 (3)** Study of the foundations of electromagnetic theory. Topics include electric fields, electric potential, dielectrics, electric circuits, solution of electrostatic boundary-value problems, magnetic fields, and magnetostatics. Includes Honors sections. *Preq:* PHYS 2210 and MATH 2080.
- PHYS 4420* Electromagnetics II 3 (3)** Continuation of PHYS 4410. Study of foundations of electromagnetic theory. Topics include magnetic properties of matter, microscopic theory of magnetization, electromagnetic induction, magnetic energy, AC circuits, Maxwell's equations, and propagation of electromagnetic waves. Other topics may include waves in bounded media, antennas, electrodynamics, special theory of relativity, and plasma physics. Includes Honors sections. *Preq:* PHYS 4410.
- PHYS 4450* Solid State Physics I 3 (3)** Topics include an overview of crystal structures, chemical and atomic bonding, and periodicity in relation to solid materials. Covers electronic, thermal, and magnetic properties of materials, electrical conduction in metals and semiconductors. Overview of the role of electrons and phonons and their interactions is presented. *Preq:* PHYS 2210.
- PHYS 4460 Solid State Physics II 3 (3)** Continuation of PHYS 4450, including selected topics in solid-state physics such as optical properties, superconductivity, non-crystalline solids, dielectrics, ferroelectrics, and nanomaterials. Plasmons, polarons, and excitons are discussed. Brief introduction into methods of solid-state synthesis and characterization tools is presented. Includes Honors sections. *Preq:* PHYS 4450.
- PHYS 4520* Nuclear and Particle Physics 3 (3)** Study of our present knowledge concerning subatomic matter. Experimental results are stressed. Topics include particle spectra, detection techniques, Regge pole analysis, quark models, proton structure, nuclear structure, scattering and reactions. Includes Honors sections.
- PHYS 4550* Quantum Physics I 3 (3)** Discussion of solution of the Schrodinger equation for free particles, the hydrogen atom, and the harmonic oscillator. Includes Honors sections. *Preq:* PHYS 3220.
- PHYS 4560* Quantum Physics II 3 (3)** Continuation of PHYS 4550. Application of principles of quantum mechanics as developed in PHYS 4550 to atomic, molecular, solid state, and nuclear systems. Includes Honors sections. *Preq:* PHYS 4550.
- PHYS 4650* Thermodynamics and Statistical Mechanics 3 (3)** Study of temperature development of the laws of thermodynamics and their application to thermodynamic systems. Introduction to low temperature physics is given. Includes Honors sections. *Preq:* PHYS 3210.
- PHYS 4750* Selected Topics 1-3 (1-3)** Comprehensive study of a topic of current interest in the field of physics. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Consent of instructor.
- PHYS 4810 Physics of Surfaces 3 (3)** Introduction for advanced undergraduates to the physics and chemical physics of solid surfaces and to the interaction of atoms and molecules with those surfaces. *Preq:* PHYS 3120 and PHYS 3220 and PHYS 3250 and PHYS 3260 and PHYS 4410.
- PHYS 4820 Surface Experiments 3 (2)** Introduction for advanced undergraduates to experimental methods of surface physics. Includes on-hands experience in advanced laboratory. *Preq:* PHYS 3120 and PHYS 3220 and PHYS 3250 and PHYS 3260 and PHYS 4410. *Coreq:* PHYS 4821.
- PHYS 4821 Surface Experiments Laboratory 0 (3)** Non-credit laboratory to accompany PHYS 4820. *Coreq:* PHYS 4820.
- PHYS 4990 Creative Inquiry—Physics and Astronomy 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor.

PACKAGING SCIENCE

Professors: D.K. Cooksey, A.L. Pometto III, R.L. Thomas; *Associate Professors:* D.O. Darby, R.M. Kimmel, W.S. Whiteside; *Assistant Professor:* R.A. Hurlley; *Senior Lecturers:* H.P. Batt, R.T. Moore; *Instructor:* G.S. Batt; *Adjunct Professors:* A.L. Brody, R.C. Cooksey, T. Downes, H.J. Park; *Adjunct Associate Professors:* L. Bix, M. Daum, A.C. Seydim, G.L. Smith; *Adjunct Assistant Professors:* R.L. Kaas, A. Rao

PKSC 1010 Packaging Orientation 1 (1) Overview of the various principles and practices in packaging science, historical development, packaging as a career.

PKSC 1020 Introduction to Packaging Science 2 (2) Considers functions of a package; materials, processes, and technology used in package development; and the relationship of packaging to the corporation, consumer, and society as a whole.

PKSC 1030 Packaging Science E-Portfolio 1 (1) Packaging Science majors initiate professional electronic portfolios that showcase their skills and experiences and lead to career e-portfolios. Students demonstrate proficiency in using important software tools; are introduced to Packaging Science faculty, emphasis areas, and targeted library services; and discuss academic integrity. *Preq:* PKSC 1010. *Preq or concurrent enrollment:* PKSC 1020.

PKSC 2010 Packaging Perishable Products 3 (3) Covers fundamental characteristics and applications of various materials and systems used to package perishable products such as foods and pharmaceuticals. Discusses packaging issues regarding food, pharmaceutical, and medical packaging. Includes product/package interactions and packaging requirements to address basic theory in food and pharmaceutical protection. *Preq or concurrent enrollment:* CH 2010 and PKSC 2020 and PKSC 2021.

PKSC 2020 Packaging Materials and Manufacturing 4 (3) Detailed study of packaging materials including glass, metal, metal foils and sheets, wood, paper, paperboard, plastics, composites, adhesives, coatings, cushioning media; their functional properties in packaging application; laminating and combining of different packaging materials. *Preq:* PKSC 1020. *Coreq:* PKSC 2021.

PKSC 2021 Packaging Materials and Manufacturing Laboratory 0 (3) Non-credit laboratory to accompany PKSC 2020. *Coreq:* PKSC 2020.

PKSC 2030 Packaging Research Fundamentals 2 (2) Principles, methods, and resources for organizing, researching, and reporting technical work in packaging science. *Preq:* PKSC 1020 and PKSC 1030 and ENGL 1030 and Packaging Science major.

- PKSC 2040 Container Systems (Rigid and Flexible) 3 (3)** Examination of all the packages and containers used to develop systems to distribute products. Compatibility of product and package, structural design, costs, and merchandising considerations are stressed. *Preq:* PKSC 2020. *Coreq:* PKSC 2060.
- PKSC 2060 Container Systems Laboratory 1 (3)** Laboratory practice in sample making, designing and constructing various containers. *Coreq:* PKSC 2040.
- PKSC 2200 Product/Package Design and Prototyping 4 (2)** Overview of structural and graphic development tools for product and packaging design. Focus on digital creation, photo rendering, wide-format plotting/proofing, rapid prototyping, visualization and real-time 2d/3d design. Course utilizes online lectures and hands-on laboratory experience at The Sonoco Institute. *Coreq:* PKSC 2201.
- PKSC 2201 Product/Package Design and Prototyping Laboratory 0 (6)** Non-credit laboratory to accompany PKSC 2200. *Coreq:* PKSC 2200.
- PKSC 2990 Creative Inquiry—Packaging Science 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. To be taken Pass/No Pass only. *Preq:* Consent of faculty member/mentor.
- PKSC 3200 Packaging Design Theory 3 (2)** Study of human factors psychology as it relates to product and package development. Lecture topics center on advanced color theory, space, shape, texture, pattern, typography, branding, marketing, consumer studies, ergonomics, sustainability and applied packaging. Laboratory focuses on developing retail packaging through applying course theory, group development and peer critique. *Preq:* PKSC 2200. *Coreq:* PKSC 3201.
- PKSC 3201 Packaging Design Theory Laboratory 0 (3)** Non-credit laboratory to accompany PKSC 3200. *Coreq:* PKSC 3200.
- PKSC 3680 Packaging and Society 3 (3)** Study of the role of packaging in society as it specifically relates to the responsibilities of the packaging scientist in protecting people and the environment. Includes study of packaging and environmental regulations and guidelines currently in place to achieve these goals. Ability to make informed decisions and ethical judgments is an encompassing goal. Includes Honors sections.
- PKSC 3990 Creative Inquiry—Packaging Science 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. To be taken Pass/No Pass only. *Preq:* Consent of faculty member/mentor.
- PKSC 4010* Packaging Machinery 3 (3)** Systematic study of types of machinery used to form, fill, seal, and handle various packaging, products, and packaging materials. Emphasizes basic mechanical, electrical, pneumatic, and hydraulic components of packaging machinery along with packaging machinery terminology. Discusses methods for machine line optimization and layout. *Preq:* Packaging Science major or minor; and PKSC 2040; and one of PHYS 2080 or PHYS 2210.
- PKSC 4030 Packaging Career Preparation 1 (1)** Preparation for a successful career in Packaging Science by completing the professional e-portfolio, and finalizing a resume and career e-portfolio. Refines career skills through role playing. Topics include presentations, interviewing, effective collaboration and communication, business and foreign travel etiquette. *Preq:* Packaging Science major or minor. *Coreq:* PKSC 4200.
- PKSC 4040* Mechanical Properties of Packages and Principles of Protective Packaging 3 (3)** Study of the mechanical properties of products and packages and standard methods of determining these properties. Focuses on the functional properties of packages related to shock and vibration isolation and compression. Includes Honors sections. *Preq:* Packaging Science major or minor and junior standing; and MATH 1060 and PKSC 2040; and one of PHYS 1220 or PHYS 2070.
- PKSC (FDSC) 4090 Total Quality Management for the Food and Packaging Industries 3 (3)** Introduction to the principles of modern quality management emphasizing quality standards and issues and the practices necessary for food processing and packaging companies to survive in a customer-driven marketplace. May also be offered as FDSC 4090.
- PKSC 4160* Application of Polymers in Packaging 4 (3)** Detailed study of polymer science and engineering as applied to packaging science. Includes polymer morphology, rheology, physical properties, processing methods, and polymerization. Emphasizes relationships among processing, structure, and properties. *Preq:* Packaging Science major or minor; and PKSC 2040 and PKSC 2060; and one of PHYS 1220 or PHYS 2070; and one of CH 2010 or CH 2230. *Coreq:* PKSC 4161.
- PKSC 4161* Application of Polymers in Packaging Laboratory 0 (3)** Non-credit laboratory to accompany PKSC 4140. *Coreq:* PKSC 4140.
- PKSC 4200* Package Design and Development 3 (2)** Study of the principles and methods practiced in designing and developing packages and packaging systems and of methods used to coordinate and analyze package development activities including interfacing with product development, manufacturing, marketing, purchasing, and accounting. *Preq:* Packaging Science major or minor and second semester Senior standing; and PKSC 3200 and PKSC 3680 and PKSC 4400. *Preq or concurrent enrollment:* PKSC 4010 and PKSC 4040 and PKSC 4160 and PKSC 4300 and PKSC 4540 and PKSC 4640. *Coreq:* PKSC 4030 and PKSC 4201.
- PKSC 4201* Package Design and Development Laboratory 0 (3)** Non-credit laboratory to accompany PKSC 4200. *Coreq:* PKSC 4200.
- PKSC 4210 Special Problems in Packaging Science 1-4 (1-4)** Independent research investigations in packaging science related to packaging materials, machinery, design, and applications. Special emphasis is placed on organizing a research proposal, conducting research, and reporting results. May be repeated for a maximum of 15 credits. *Preq:* Consent of instructor.
- PKSC 4220 Selected Topics in Packaging Science 1-3 (1-3)** Comprehensive study of selected topics in packaging science not covered in detail or contained in other courses. Contemporary developments in each area are stressed. May be repeated for a maximum of 15 credits, but only if different topics are covered. *Preq:* Consent of instructor.
- PKSC 4230 3D Parametric Design Online 3 (3)** Provides an overview of the techniques used in designing 3D parametrics solid parts for packaging science applications. The course begins with a basic overview of design software and progresses to cover advanced applications, including simulation, surfacing, tooling, photorendering and sustainability. Additionally, this course prepares students for a professional certification exam. Recommended for students who have experience with design software.
- PKSC 4240* Structural Packaging Design Online 3 (3)** Provides a comprehensive overview of how to design structural packaging for paperboard and corrugated mediums. This course begins with a basic overview and transitions into covering advanced applications. Access to design software (vector-based 2D CAD software, such as Illustrator or ArtiosCAD) is required. Recommended for students with design software experience.
- PKSC 4300* Converting for Flexible Packaging 3 (1)** Study of materials, methods, processes, and equipment used in converting web materials for flexible packaging. Laboratory provides hands-on experience preparing and operating pilot-scale converting equipment. *Preq:* Packaging Science major or minor; and PKSC 2040. *Coreq:* 4301.
- PKSC 4301* Converting for Flexible Packaging Laboratory 0 (6)** Non-credit laboratory to accompany PKSC 4300. *Coreq:* PKSC 4300.
- PKSC 4400* Packaging for Distribution 3 (3)** Packages are exposed to various shipping methods and numerous hazards during distribution. To ensure adequate product protection, packaging professionals need to understand the fundamental principles of distribution packaging design. Topics include ASTM and ISTA packaging test methods, packaging design guidelines for distribution, terminology, transport modes, distribution hazards, and protective packaging materials. *Preq:* Packaging Science major or minor; and PKSC 4040.
- PKSC 4540* Product and Package Evaluation Laboratory 1 (3)** Laboratory experiments to determine properties of packaging materials and to evaluate the response of packages and products to shock, vibration, and compression. Students operate standard testing equipment and become familiar with industry recognized test methods and standards. *Preq:* Packaging Science major or minor. *Preq or concurrent enrollment:* PKSC 4040.

PKSC 4640* Food and Health Care Packaging Systems 4 (3) Characteristics, engineering properties, and applications of various materials and systems used in the packaging of foods, pharmaceuticals, and medical devices. Packaging systems for specific food and medical applications are considered. Laboratory and field exercises on food and medical packaging operations and packaging materials are included. Emphasis is on evaluation methods. Includes Honors sections. *Prereq:* Packaging Science major or minor or Food Science major or minor; and one of PKSC 2010 or FDSC 2140; and PKSC 2040. *Coreq:* PKSC 4641.

PKSC 4641* Food and Health Care Packaging Systems Laboratory 0 (3) Non-credit laboratory to accompany PKSC 4640. *Coreq:* PKSC 4640.

PKSC 4980 Creative Inquiry Laboratory 1-3 (3-9) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams based on laboratory experimentation. Projects may be interdisciplinary in nature. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits, but the combined credits earned from PKSC 4980 and 4990 may not exceed eight.

PKSC 4990 Creative Inquiry—Packaging Science 1-3 (1-3) Students engage in creative inquiry projects such as surveys or literature research that do not require a laboratory component. Projects may be interdisciplinary in nature. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits, but the combined credits earned from PKSC 4980 and 4990 may not exceed eight.

PLANT PATHOLOGY

Professors: S.N. Jeffers, S.B. Martin, S.W. Scott;
Associate Professors: P. Agudelo, J. Kerrigan

PLPA 2130 Fungi and Civilization 3 (3) Overview of how fungi affect the lives of humans, both currently and historically. Addresses the diversity of fungi and the tremendous roles fungi play on the planet with respect to the biological, social and ethical consequences. The general nature of this course makes it beneficial to all students.

PLPA 3020 Plant Pathology Research 1-3 (1-3) Research experience in a plant pathology project for undergraduates who understand basic concepts of research. Students develop research objectives, procedures, and collect data. A written report includes interpretation of results. To be taken Pass/No Pass only. Includes Honors sections. *Prereq:* Consent of instructor.

PLPA 3100 Principles of Plant Pathology 3 (2) Introduction to diseases caused by biotic and abiotic agents, symptom development, diagnosis, economics, control, and relationship of plant diseases to human welfare, including the uses of genetic engineering to develop disease resistant crops. *Prereq:* BIOL 1110; or BIOL 1040 and BIOL 1060. *Coreq:* PLPA 3101.

PLPA 3101 Principles of Plant Pathology Laboratory 0 (3) Non-credit laboratory to accompany PLPA 3100. *Coreq:* PLPA 3100.

PLPA (ENT) 4060* Diseases and Insects of Turfgrasses 2 (2) Host-parasite relationships, symptomatology, diagnosis, economics, and control of infectious diseases of turfgrasses and life histories, diagnosis, and control of important insect pests of turfgrasses. May also be offered as ENT 4060. *Prereq:* ENT 3010 and PLPA 3100.

PLPA (ENT) 4080* Diseases and Insects of Turfgrasses Laboratory 1 (3) Laboratory to complement PLPA 4060 or ENT 4060 to learn symptomatology, diagnosis, and control of infectious diseases of turfgrasses and diagnosis of damage caused by important insect pests of turfgrasses. May also be offered as ENT 4080. *Prereq:* PLPA 4060 or ENT 4060.

PLPA 4110* Plant Disease Diagnosis I 3 (2) Methods and procedures used in the diagnosis of plant diseases, especially late spring and early summer diseases. Basic techniques of pure culture and identification of plant pathogens and Koch's postulates are taught. Diagnosis of a wide variety of diseases of cultivated and wild plants is carried out. Offered summer session only. *Prereq:* PLPA 3100. *Coreq:* PLPA 4111.

PLPA 4111* Plant Disease Diagnosis I Laboratory 0 (3) Non-credit laboratory to accompany PLPA 4110. *Coreq:* PLPA 4110.

PLPA (BIOL) 4250* Introductory Mycology 3 (3) Introduction to the biology of all the groups of fungi and some related organisms, with considerations of the taxonomy, morphology, development, physiology, and ecology of representative forms. May also be offered as BIOL 4250. *Prereq:* BIOL 1040 and BIOL 1060; or BIOL 1110. *Prereq or concurrent enrollment:* BIOL 4260 or PLPA 4260.

PLPA (BIOL) 4260* Mycology Practicum 2 (1) Application of the principles of mycological techniques, microscopic study of fungi. Examples from all major groups of fungi are included. May also be offered as BIOL 4260. *Prereq or concurrent enrollment:* BIOL 4250 or PLPA 4250. *Coreq:* PLPA 4261.

PLPA (BIOL) 4261* Mycology Practicum Laboratory 0 (2) Non-credit laboratory to accompany PLPA 4260. May also be offered as BIOL 4261. *Coreq:* PLPA 4260.

PLPA (BIOL) 4540* Plant Virology 4 (3) Study of plant viruses: their morphology, biochemistry, purification, and transmission; symptoms resulting from virus infection; virus vector relationships. Serological and nucleic acid hybridization procedures. Diagnosis of viral diseases and the identification of causal agents. Replication of plant viruses, the interaction between viral host and plant genome. Control of plant viral diseases. May also be offered as BIOL 4540. *Prereq:* BCHM 3010 or BCHM 3050 or MICR 3050. *Coreq:* PLPA 4541.

PLPA (BIOL) 4541* Plant Virology Laboratory 0 (3) Non-credit laboratory to accompany PLPA 4540. May also be offered as BIOL 4541. *Coreq:* PLPA 4540.

PLPA 4590* Plant Nematology 3 (2) Introduction to nematodes emphasizing plant parasitic nematodes. Introduces morphology of nematodes as it relates to their taxonomic position and ability to cause diseases. Includes diagnosis and control of nematode diseases, along with use of nematodes in studies of molecular interaction and genetics involvement in developing resistance. *Prereq:* PLPA 3100.

PLPA 4591* Plant Nematology Laboratory 0 (3) Non-credit laboratory to accompany PLPA 4590. *Coreq:* PLPA 4590.

PLPA 4700* Molecular Plant Pathogen Interactions 3 (3) Study of the interactions of plants and pathogens at the molecular level. Investigates the molecular and genetic components of plant disease and how these can be used for improvement and understanding of how diseases occur and how these can be used for possible disease management. *Prereq:* PLPA 3100.

PORTUGUESE

PORT 1010 Elementary Portuguese 4 (3) Introduction to speaking, listening, and writing. Attention is given to the sound system of Portuguese to develop basic communication skills. *Coreq:* PORT 1011.

PORT 1011 Elementary Portuguese Laboratory 0 (1) Non-credit laboratory to accompany PORT 1010. *Coreq:* PORT 1010.

PORT 1020 Elementary Portuguese 4 (3) Continuation of PORT 1010. *Prereq:* PORT 1010. *Coreq:* PORT 1021.

PORT 1021 Elementary Portuguese Laboratory 0 (1) Non-credit laboratory to accompany PORT 1020. *Coreq:* PORT 1020.

PORT 2010 Intermediate Portuguese 3 (3) Intermediate course with more emphasis on communication skills and structure. Reading and writing practice in and outside the classroom, with special attention to idiomatic usage. Introduction to perspectives through readings and cultural activities. *Prereq:* PORT 1020.

PORT 2020 Intermediate Portuguese 3 (3) Continuation of PORT 2010. *Prereq:* PORT 2010.

POLITICAL SCIENCE

Professors: X. Hu, W. Lasser, L.R. Olson, J.S. Peake, *Chair;* B.W. Ransom, J.E. Stewart Jr., C.B. Thompson, J.D. Woodard; *Associate Professors:* J.A. Fine, Z. Taydas, A.L. Warber; *Assistant Professors:* K.A. Curtis, D. Frost, S.V. Miller, B.P. Turner; *Senior Lecturer:* V. Matic

POSC 1010 American National Government 3 (3) Introduction to American national government and politics examining topics such as the Constitution, federalism, political institutions, political behavior, and political participation. Includes Honors sections.

POSC 1020 Introduction to International Relations 3 (3) Overview of both theory and practice in contemporary global politics. Topics include the structure of and primary actors in the international system; reasons conflict occurs; and roles of international institutions, law, and policy. Includes Honors sections.

POSC 1030 Introduction to Political Theory 3 (3) Introduction to major themes and thinkers in the Western tradition of political thought. Students examine classic primary texts of the ancient and modern periods, including Plato, Aristotle, Hobbes and Locke, to acquire a working conceptual vocabulary of normative and theoretical terms, political ideologies, and basic patterns of political organization. Includes honors sections.

- POSC 1040 Introduction to Comparative Politics 3 (3)** Introduction to the study of comparative politics in the post-Cold War era, with emphasis on theories and applications. Topics include democratic and nondemocratic systems; ideology; political culture; party systems; and legislative, executive, and judicial structures. Includes Honors sections.
- POSC 1990 Introduction to Political Science 1 (1)** Introduction to political science as a discipline. Topics include an overview of the subfields within political science, core research methodologies and source materials, and ethical issues related to the study of political science.
- POSC 3020 State and Local Government 3 (3)** Introduction to American state and local governments, including examination of nature and scope of non-national governments and their interaction with the U.S. federal system. Emphasis is on structural features, functions, and policies of non-national governments.
- POSC 3050 Creative Inquiry—Political Science 1-3 (1-3)** Engages students in faculty-led research projects. May be repeated for a maximum of six credits. No more than three hours from POSC 3050, 3100, 3110, 3120, 3130, 4090, 4100 may be applied toward a Political Science major, minor, or a Global Politics minor. *Preq:* Consent of instructor.
- POSC 3100 Political Science Internship 1-3 (1-3)** Off-campus internship for at least one semester equivalent. May be repeated for a maximum of three credits. No more than three hours from POSC 3050, 3100, 3110, 3120, 3130, 4090, 4100 may be applied toward a Political Science major, minor or a Global Politics minor. No more than six hours from POSC 3100, 3110, 3120, 3130 may be applied toward any other degree. *Preq:* Consent of instructor.
- POSC 3110 Model United Nations 1 (1)** United Nations simulation exercises. May be repeated for a maximum of six credits. No more than three hours from POSC 3050, 3100, 3110, 3120, 3130, 4090, 4100 may be applied toward a Political Science major, minor, or a Global Politics minor. No more than six hours from POSC 3100, 3110, 3120, 3130 may be applied toward any other degree.
- POSC 3120 State Student Legislature 1 (1)** State student legislature simulation exercises. May be repeated for a maximum of six credits. No more than three hours from POSC 3050, 3100, 3110, 3120, 3130, 4090, 4100 may be applied toward a Political Science major, minor, or a Global Politics minor. No more than six hours from POSC 3100, 3110, 3120, 3130 may be applied toward any other degree.
- POSC 3130 Clemson University Model United Nations Conference 1 (1)** Facilitation of annual high school Model United Nations conference held on Clemson campus. No more than three hours from POSC 3050, 3100, 3110, 3120, 3130, 4090, 4100 may be applied toward a Political Science major, minor, or a Global Politics minor. No more than six hours from POSC 3100, 3110, 3120, 3130 may be applied toward any other degree. May be repeated for a maximum of three credits.
- POSC 3210 Public Administration 3 (3)** Introduction to public administration, including the elements of organization, personnel and financial management, administrative law, and administrative responsibility. *Preq:* Sophomore standing.
- POSC 3410 Quantitative Methods in Political Science 3 (3)** Introduction to quantitative research methods in political science. Topics include research design, measurement, data collection, sampling procedures, and applications of statistical techniques to research problems in political science. Also stresses computer use for elementary data analysis.
- POSC 3430 Mass Media in American Politics 3 (3)** Role and impact of the mass media in the American political system, emphasizing the media's role in shaping public opinion and in influencing government and public policy. *Preq:* POSC 1010.
- POSC 3610 International Politics in Crisis 3 (3)** Factors contributing to the prevalence of tension and conflict in the contemporary global arena are identified and analyzed, with particular emphasis on political, economic, and military elements. Includes Honors sections. *Preq:* Sophomore standing.
- POSC 3620 International Organizations 3 (3)** Examines normative and institutional foundations of civil society. Explains the formal institutions, decision-making processes, and multilateral capacities of international governmental and nongovernmental organizations. *Preq:* Sophomore standing.
- POSC 3630 United States Foreign Policy 3 (3)** American foreign policy in historical perspective, with particular emphasis on the decision-making process, contemporary American capabilities and challenges, and analysis of key issues. *Preq:* Sophomore standing.
- POSC 3710 European Politics 3 (3)** Major emphasis on European governments and issues of importance in the European context. Current methods of comparison are studied and applied to the formal and informal functioning of European governments. *Preq:* Sophomore standing.
- POSC 3720 Political Culture of East Asia 3 (3)** Introduction to political culture that commonly characterizes East Asian countries, with emphasis on political subcultures of different nations, and on the analysis of the mutual influence between politics and culture. *Preq:* Sophomore standing.
- POSC 3750 European Integration 3 (3)** Survey course analyzing increasing institutional cooperation between European countries with a focus on the European Union. Includes Honors sections. *Preq:* Sophomore standing.
- POSC 3810 African American Politics 3 (3)** Examination of African American political thought, interests and agenda setting, and dynamics of African Americans' participation in political and governmental decision making. *Preq:* Sophomore standing.
- POSC 3890 Selected Topics 1-3 (1-3)** Study of a selected area of political science. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Junior standing.
- POSC 3950 Junior Honors Research Seminar 1 (1)** Readings and discussion to prepare for the Junior Research Paper and the Senior Thesis. *Preq:* Junior standing and membership in Calhoun Honors College.
- POSC 3960 Junior Honors Research 1 (1)** Readings and research in conjunction with an approved political science course at the 3000 or 4000 level. *Preq:* Junior standing and membership in Calhoun Honors College.
- POSC 4030 United States Congress 3 (3)** Examination of the evolution of Congress, congressional elections, the organization of the legislative branch, congressional rules and procedures, decision making, styles of representation, and policymaking. *Preq:* Sophomore standing.
- POSC 4050 The American Presidency 3 (3)** Examines the evolution of the presidency, the powers of the chief executive, the public presidency, executive branch organization and staffing, decision making, and political relations with Congress and the federal judiciary. *Preq:* Sophomore standing.
- POSC 4070 Religion and American Politics 3 (3)** Examines the impact of religion on American politics, including an analysis of the role of religion in politics, political behavior of major religious groups, constitutional issues and voting behavior. *Preq:* Sophomore standing.
- POSC 4090* Directed Study in American Politics 1-3 (1-3)** Supervised reading/research in selected areas of American politics. May be repeated for a maximum of six credits. No more than three hours from POSC 3050, 3100, 3110, 3120, 3130, 4090, 4100 may be applied toward a Political Science major, minor, or a Global Politics minor. *Preq:* Consent of instructor.
- POSC 4100 Directed Study in International Politics 1-3 (1-3)** Supervised reading/research in selected areas of international/comparative politics. May be repeated for a maximum of six credits. No more than three hours from POSC 3050, 3100, 3110, 3120, 3130, 4090, 4100 may be applied toward a Political Science major, minor, or a Global Politics minor. *Preq:* Consent of instructor.
- POSC 4160* Interest Groups and Social Movements 3 (3)** Empirical and normative examination of the origins, roles, and influence of interest groups and social movements in the United States and of the relationships among interest groups, social movements, and democratic theory. *Preq:* Sophomore standing.
- POSC 4210* Public Policy 3 (3)** Introduction to the major approaches to public policy making in American government. Topics include theories and models of policy making, the identification of policy problems, agenda setting, the formulation and adoption of policy, implementation, and program evaluation. *Preq:* Sophomore standing.
- POSC 4230* Urban Politics 3 (3)** Examines the nature and scope of politics in urban communities and offers an analysis of urban governance, especially in the interaction of public authority and private institutions in metropolitan areas. Emphasis is on the structure, processes, and problems challenging governments in urban America. *Preq:* Sophomore standing.
- POSC 4240* Federalism and Intergovernmental Relations 3 (3)** Introduction to the historical, theoretical, legal, and fiscal aspects of constitutionally divided government. Federal, state, and local division of responsibility for public services is emphasized, along with the emerging devolution of those responsibilities from the federal government to states and localities. *Preq:* Sophomore standing.

- POSC 4280* National Security Policy 3 (3)** National security threats and policy decision making. Issues covered include weapons of mass destruction, terrorism, organized crime, narcotics, arms control, intelligence, and homeland security. Students deliberate and assess threat priorities and crisis management. *Prq:* Sophomore standing.
- POSC 4290* Global Issues 3 (3)** Analysis, assessment, and management of the principal threats facing global security today. Topics include rogue nations, regional superpowers, alliances, organized crime, illegal weapons proliferation, and corruption. Emphasis is on the strategies available to the international community for dealing with these threats. *Prq:* Sophomore standing.
- POSC 4300 Public Policy Evaluation 3 (3)** Discussion of the role of policy analysis in government. Applications of analytical and computer tools to substantive policy areas such as transportation, economic/community development, education, poverty, and health. Students focus on assessing a policy from a set of options based on analytic criteria as well as developing policy alternatives. *Prq:* POSC 3410 or STAT 2300 or STAT 3300.
- POSC 4360 Law, Courts, and Politics 3 (3)** Introduces the principal features of the American legal system. Analyzes how and why legal actors and institutions operate as they do. Explores how the law functions as both a tool and an institution of government, as well as how the court system affects the formation and implementation of public policies. *Prq:* Sophomore standing.
- POSC 4370* American Constitutional Law: Rights and Liberties 3 (3)** Examination and analysis of Supreme Court decisions and other legal materials in the areas of civil rights and civil liberties, with an emphasis on freedom of speech, freedom of religion, equal protection of the laws, and privacy rights. *Prq:* Sophomore standing.
- POSC 4380* American Constitutional Law: Structures of Government 3 (3)** Examination and analysis of Supreme Court decisions and other legal materials in the areas of national power, federalism, the separation of powers, and the role of the judiciary. *Prq:* Sophomore standing.
- POSC 4420* Political Parties and Elections 3 (3)** Study of the distinctive features of the American two-party system with emphasis on presidential elections. Parties are examined as formal organizations, coalitions of voters and interest groups, coordinators of nomination and election processes, and managers of policy-making institutions. *Prq:* Sophomore standing.
- POSC 4430 Political Behavior 3 (3)** Offers students a comprehensive introduction to how individuals think, act and behave in their engagement in politics. *Prq:* Sophomore standing.
- POSC 4470 International Law 3 (3)** Study of the inherently political nature of international law and the ways in which international law relates closely to both international and domestic politics. This course examines the use, design and consequences of international law for a wide range of players in world politics. *Prq:* Sophomore standing.
- POSC 4480* International Political Economy 3 (3)** Provides students with background knowledge and conceptual tools for understanding the politics of contemporary international economic relations. Students are introduced to the major issues of the international political economy and different perspectives approaching these issues. *Prq:* Sophomore standing.
- POSC 4490 Political Theory of Capitalism 3 (3)** Examines the ethical foundations of capitalism. Focuses primarily on the major ethical theories that have supported or criticized capitalism throughout history. Topics include justification of private property, role of corporations, the profit motive, and the source of wealth creation. *Prq:* Sophomore standing.
- POSC 4500 Special Topics in Political Theory 3 (3)** Intensive examination of a selected political philosopher, conceptual area within political theory, or political thought of a particular era. May be repeated for a maximum of six credits, but only if different topics are covered. *Prq:* Sophomore standing.
- POSC 4530 American Political Thought 3 (3)** American political philosophy from the 17th century to the present with emphasis on political and social developments since the 1770's. *Prq:* Sophomore standing.
- POSC 4540* Southern Politics 3 (3)** Examination of the unique political environment of the American South, with emphasis on the events and social forces that have shaped politics in the region since World War II. Course material is approached from a variety of perspectives, including history, literature, social themes, and political culture. *Prq:* Sophomore standing.
- POSC 4550 Political Thought of the American Founding 3 (3)** Intensive seminar of the principles and practices of America's founders (e.g., Washington, Adams, Jefferson, Madison, and Hamilton). Examines how American revolutionaries struggled between 1765 and 1788 to develop new ideas about rights, liberty, equality, constitutions, republicanism, separation of powers, representation, federalism, etc. *Prq:* Sophomore standing.
- POSC 4560 Diplomacy: The Art of Negotiation 3 (3)** Examines the conduct of foreign policy in the historical and contemporary context. Explores theories and key concepts of international negotiation, offering a comparative look at the behavior and practice of major powers. *Prq:* Sophomore standing.
- POSC 4570* Political Terrorism 3 (3)** Examination and analysis of the international phenomenon of terrorism in terms of origins, operations, philosophy, and objectives. *Prq:* Sophomore standing.
- POSC 4580* Political Leadership 3 (3)** Comparative examination of political leaders, focusing particularly on types, methods, and consequences of leadership and on the relationship between leaders and followers. *Prq:* Sophomore standing.
- POSC 4590 Ethnic Violence 3 (3)** Examination of both theories and case studies of ethnic violence in today's world, with emphasis on understanding potential strategies of conflict resolution. *Prq:* Sophomore standing.
- POSC 4610* American Diplomacy and Politics 3 (3)** Analyzes the process of making and implementing strategies to protect and promote American national interests. Focuses on the role of government agencies and executive-legislative relations, as well as the participation and influence of interest groups and the media. Includes a five-day seminar in Washington, DC. *Prq:* Consent of instructor.
- POSC 4660 African Politics 3 (3)** Comprehensive survey of major regional blocks, as well as analysis of individual states and thematic concepts. *Prq:* Sophomore standing.
- POSC 4710 Russian Politics 3 (3)** Comprehensive examination of the Russian Federation since the fall of the Soviet Union. The successes and failures of democratic transition are analyzed, with topics covering political participation, organized crime and corruption, center-periphery conflict, and ethnic/religious unrest. *Prq:* Sophomore standing.
- POSC 4760 Middle East Politics 3 (3)** Comprehensive thematic and empirical analysis of the Middle East region. Issues covered include democratization, political and religious freedom, oil, the role of women, and terrorism. States analyzed include Syria, Jordan, Iran, Iraq, Saudi Arabia, Turkey, and the Gulf States. *Prq:* Sophomore standing.
- POSC 4770 Chinese Politics 3 (3)** Concepts and operation of contemporary China's political system; emphasizes institutional innovation and political economy in recent reforms. *Prq:* Sophomore standing.
- POSC 4780 Latin American Politics 3 (3)** Survey of prominent trends in Latin American politics, with a focus on major countries in the region and major issues affecting the region. Relations between Latin America and the United States and other prominent countries are also considered. *Prq:* Sophomore standing.
- POSC 4800* Gender and Politics 3 (3)** Examination of the role of gender in politics in the United States and in other countries. Particular emphasis on the role of women in electoral politics, issues of gender, women's rights as human rights, and feminist theory. *Prq:* Sophomore standing.
- POSC 4820 Political Novel and Film 3 (3)** Examination of political novels and films. Emphasizes the development of these media as art forms; the relationship between political novels and films and politics at large; and the role of these media in shaping public opinion. *Prq:* Sophomore standing.
- POSC (LANG) 4850* Global Affairs and Governments 3 (3)** Designed for teachers and education students who wish to learn how to incorporate global affairs more fully into high school curricula. Overview of major topics involving foreign policies and world politics is provided. May also be offered as LANG 4850.
- POSC 4890* Selected Topics 1-3 (1-3)** Intensive examination of a selected area of political science. May be repeated for a maximum of six credits, but only if different topics are covered. *Prq:* Junior standing.
- POSC 4900 Senior Honors Thesis Research 3 (3)** Reading and research related to the senior honors thesis. *Prq:* POSC 3960 and Senior standing and membership in Calhoun Honors College.

POSC 4910 Senior Honors Thesis 3 (3) Research and writing of the senior honors thesis. *Prereq:* POSC 4900 and Senior standing and membership in Calhoun Honors College.

POSC 4990 Professional Development in Political Science I (1) Allows students to reflect on their experience as political science majors. Topics include understanding of cross-disciplinary issues, current research in political science, career options, and ethical issues related to the study of political science. To be taken Pass/No Pass only. *Prereq:* Senior standing in Political Science.

PARKS, RECREATION AND TOURISM MANAGEMENT

Professors: L.R. Allen, S.J. Backman, R.H. Becker, F.A. McGuire, D.J. Thomason, B.A. Wright, *Chair; Associate Professors:* D.M. Anderson, K.F. Backman, R.D. Bixler, W.C. Norman; *Assistant Professors:* S.G. Arthur-Banning, E.B. Baldwin, A.L. Cory, J.C. Hallo, R.B. Powell, G.P. Ramshaw, D.L. Schmalz; *Lecturers:* D.M. Anderson, R.S. Brookover, L.E. Conrad, R.A. Lucas, A.R. Savedra

PRTM 1010 Concepts of Leisure 3 (3) Introduces recreation professions and organizations: government, voluntary, and commercial; overviews professional preparation; outlines development of man's uses of leisure and evolution of recreation, city parks, natural resources conservation, and preservation movements as philosophical forces affecting leisure services. Restricted to Parks, Recreation and Tourism Management majors.

PRTM 1950 Professional Golf Management Seminar I 1 (1) Covers career planning and professional development training needed in the golf industry with special emphasis on topics covered in the PGA/PGM Level I Training Program. *Prereq:* PRTM 2810 and consent of instructor.

PRTM 1980 Creative Inquiry—Parks, Recreation and Tourism Management I 1-4 (1-3) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. To be taken Pass/No Pass only. *Prereq:* Consent of faculty member/mentor. *Coreq:* PRTM 1981.

PRTM 1981 Creative Inquiry—Parks, Recreation and Tourism Management I Laboratory 0 (1-12) Non-credit laboratory to accompany PRTM 1980. *Coreq:* PRTM 1980.

PRTM 2000 The Profession and Practice in Parks Recreation, and Tourism Management I (1) Introduces students to the Parks, Recreation and Tourism Management field. Covers the history and development of the PRTM profession, including professional organizations, current issues and trends, ethical principles and professionalism, and professional competencies and development. To be taken Pass/No Pass only.

PRTM 2010 The Recreation/Leisure Environment 3 (3) Discusses the development characteristics of built and natural environmental resource settings for recreation, tourism development, and community expression. Examines human/environment interactions during leisure, including the impact of the recreation environment on people and the impact of people on the recreation environment. Surveys public agencies and private interests in these settings. Includes Honors sections.

PRTM 2050 Program and Event Planning 3 (2) Principles and methods of program development. Time and facility utilization for sports activities, social functions, arts and crafts, outdoor activities, hobbies or special-interest groups, and activities in the cultural and performing arts are pursued. *Prereq:* PRTM 1010. *Coreq:* PRTM 2051.

PRTM 2051 Program and Event Planning Laboratory 0 (2) Non-credit laboratory to accompany PRTM 2050. *Coreq:* PRTM 2050.

PRTM 2060 Practicum I 1 (3) Students conduct a recreation program in a supervised setting. A minimum of 90 hours with a leisure agency approved by the University is required. To be taken Pass/No Pass only. *Prereq:* PRTM 2270.

PRTM 2070 Practicum II 1 (3) Continuation of PRTM 2060. Experience in a leisure situation different from the PRTM 2060 exposure. A minimum of 90 hours with a leisure agency approved by the University is required. To be taken Pass/No Pass only. *Prereq:* PRTM 2270.

PRTM 2100 Serving Diverse Populations in Parks, Recreation and Tourism Management 3 (3) Introduces students to the leisure patterns and constraints of diverse constituents, including members of ethnic and racial minorities, people of diverse socioeconomic status, women, older adults, people with disabilities, and people with alternative lifestyles. *Prereq:* PRTM 1010.

PRTM 2110 Impacts of Technology and Science in the Context of Play, Recreation and Tourism 3 (3) Examines the relationship among society, technology, and tourism and recreation. Introduces theories of play, recreation and tourism as they relate to social concerns. Students learn how science and technology have impacted how people play, recreate and travel.

PRTM 2200 Conceptual Foundations of Parks, Recreation and Tourism 3 (3) Introduces students to the background, nature and scope of the profession, including its history, philosophy, and social and behavioral science underpinnings.

PRTM 2210 Delivery Systems for Parks, Recreation and Tourism 2 (2) Introduces students to the various roles, interrelationships, and importance of leisure service delivery systems in designing and operating programs and facilities to serve diverse populations. Also includes discussion of the role and impact of leisure services and community and economic development. *Prereq:* PRTM 2000.

PRTM 2220 Program and Event Planning in Parks, Recreation and Tourism 3 (2) Introduces concepts, principles, and skills necessary to plan, implement, and evaluate leisure and recreation programs and events. Topics include assessing needs, developing goals and objectives, selecting programs, events, and resources, marketing, venues, implementation, evaluation, group dynamics and leadership techniques. *Prereq:* PRTM 2000. *Coreq:* PRTM 2221.

PRTM 2221 Program and Event Planning in Parks, Recreation and Tourism Laboratory 0 (1) Non-credit laboratory to accompany PRTM 2220. *Coreq:* PRTM 2220.

PRTM 2230 Administration/Management in Parks, Recreation and Tourism 4 (3) Covers the concepts, principles, and skills of administration/management as they relate to leisure and recreation services. Topics include the fundamental principles of research and data analysis, management, human resources management, supervisory leadership, budgeting and financial management, marketing, professional communication, technology, and facility planning and operations. *Prereq:* PRTM 2000. *Coreq:* PRTM 2001.

PRTM 2231 Administration/Management in Parks, Recreation and Tourism Laboratory 0 (0) Non-credit laboratory to accompany PRTM 2230. *Coreq:* PRTM 2230.

PRTM 2240 Legal Aspects of Parks, Recreation and Tourism 2 (2) Introduces legal foundations and legislative processes, contracts and tort law, regulatory agents and methods of compliance, safety, emergency, and risk management as they relate to recreation, park resources, and leisure services. *Prereq:* PRTM 2000.

PRTM 2260 Foundations of Management and Administration in Parks, Recreation and Tourism Management 6 (5) Course covers the learning outcomes related to the management and administration of leisure services required for program accreditation by National Recreation and Parks Association. Topics include basic management history and functions, personnel and labor law, marketing, finance, and strategic management as they relate to the Parks, Recreation and Tourism Management field. *Coreq:* PRTM 2261 and PRTM 2270 and PRTM 2290.

PRTM 2261 Foundations of Management and Administration in Parks, Recreation and Tourism Management Laboratory 0 (2) Non-credit laboratory to accompany PRTM 2260. *Coreq:* PRTM 2260.

PRTM 2270 Provision of Leisure Service Experiences 5 (4) Course covers the learning outcomes related to the provision of leisure service experiences required for program accreditation by National Recreation and Parks Association. Topics include program design, facilitation, and evaluation as they relate to the Parks, Recreation and Tourism Management field. *Coreq:* PRTM 2260 and PRTM 2271 and PRTM 2290.

PRTM 2271 Provision of Leisure Service Experiences Laboratory 0 (2) Non-credit laboratory to accompany PRTM 2270. *Coreq:* PRTM 2270.

- PRTM 2290 Distributed Competency Integration in Parks, Recreation and Tourism Management 3 (3)** Covers and reinforces critical and creative thinking processes, ethical judgment, oral communication skills, and written communication skills as applied to the Parks, Recreation and Tourism Management field. In addition, students are given refresher/enhancement seminars on spreadsheets, presentation software and word processing software. *Coreq:* PRTM 2260 and PRTM 2270.
- PRTM 2410 Introduction to Community Recreation, Sport and Camp Management 3 (3)** Conceptual examination of community recreation, including the history and structure of public and private nonprofit recreation agencies with an emphasis on programs and services, career opportunities, funding mechanisms, the role of government, and current trends and issues impacting delivery of services.
- PRTM 2540 Introduction to Sport Management 3 (3)** Development of a conceptual understanding of sport management, career opportunities in sport management, and the necessary competencies for the different career fields.
- PRTM 2600 Foundations of Recreational Therapy 3 (3)** Examines the history, philosophy, concepts, roles and functions involved in recreational therapy services. Topics include service-delivery models, ethics, standards of practice, credentialing, use of the clinical process in various treatment settings, collaborative interdisciplinary practice and professional behavior specific to therapeutic relationships and practitioner/client interactions. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Coreq:* PRTM 2650.
- PRTM 2650 Terminology in Recreational Therapy Practice 1 (1)** Provides students with the opportunity to learn about the language of health care, including basic term components, medical terms and health care records, and terms associated with body systems. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Coreq:* PRTM 2600.
- PRTM 2700 Introduction to Recreation Resources Management 3 (3)** Fundamentals of recreation resources management are presented to include the framework of management, management of specific resources, management of visitors, and management of services. Includes Honors sections.
- PRTM 2810 Introduction to Golf Management 3 (2)** Development of a conceptual understanding of the golf industry, career opportunities in professional golf management, and specific introductory competencies utilized within the field. *Preq:* Professional Golf Management concentration and consent of instructor. *Coreq:* PRTM 2811.
- PRTM 2811 Introduction to Golf Management Laboratory 0 (3)** Non-credit laboratory to accompany PRTM 2810. *Coreq:* PRTM 2810.
- PRTM 2820 Principles of Golfer Development 3 (3)** Introduction to golf instruction. Provides knowledge and skills necessary to develop successful golf programs. *Preq:* PRTM 2810.
- PRTM 2830 Advanced Methods of Teaching Golf 3 (3)** Provides students with the knowledge and skills necessary to succeed as golf instructors. Particular emphasis is on golf swing mechanics, learning styles and motivation theory, the business of teaching golf, and the use of advanced technology in golf instructions. *Preq:* PRTM 2820.
- PRTM 2950 Professional Golf Management Seminar II 1 (1)** Introduction to the golf industry, professionalism, and current issues of interest in the industry with special emphasis on topics covered in the PGA/PGM Training Program Level I. *Preq:* PRTM 1950.
- PRTM 2980 Creative Inquiry—Parks, Recreation and Tourism Management II 1-4 (1-3)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor. *Coreq:* PRTM 2981.
- PRTM 2981 Creative Inquiry—Parks, Recreation and Tourism Management II Laboratory 0 (1-12)** Non-credit laboratory to accompany PRTM 2980. *Coreq:* PRTM 2980.
- PRTM 3010 Recreation and Society 3 (3)** Investigation of the role of recreation in a technological and work-oriented society. Particular emphasis is on recreation behavior, resources, and programming in public and private organizations that serve the public wants. Not open to Parks, Recreation and Tourism Management majors; may not be substituted or otherwise used to meet Parks, Recreation and Tourism Management area requirements. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 3040 Challenge Course Facilitation 3 (2)** Develops knowledge and skill in planning, directing, and evaluating group performance in an adventure challenge course environment; emphasis is placed on low and high ropes elements, processing, assessment, safety, and course management. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Coreq:* PRTM 3041.
- PRTM 3041 Challenge Course Facilitation Laboratory 0 (2)** Non-credit laboratory to accompany PRTM 3040. *Coreq:* PRTM 3040.
- PRTM 3050 Safety and Risk Management in Parks, Recreation and Tourism Management 3 (3)** Provisions of safe services, facilities, and activities in the parks, recreation, and tourism domain are studied through the application of germane concepts from the areas of safety, risk management, and liability. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 3070 Facility Planning and Operations 3 (3)** Introduction to recreation facility planning and operations processes. Design, planning, financing, construction, budgeting, personnel, operating policies and procedures, maintenance, and equipment considerations are covered. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 3080 Leadership and Group Processes in Recreation 3 (3)** Leadership is analyzed through experience-based learning. Examines various styles of leadership and communication and their probable consequences. Considers techniques for planning large and small group meetings. Examines literature in the field of leadership and group processes. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 3090 Behavioral Concepts in Parks, Recreation and Tourism 3 (3)** Studies social psychological concepts concerning leisure behavior in various park, recreation, and tourism settings. Students learn to apply those theories and behavioral concepts required to understand and manage leisure activities and environments. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 3100 Seminar in Therapeutic Recreation 1 (1)** Examination and discussion related to evidence-based practice in therapeutic recreation settings. *Preq:* PRTM 2000 or PRTM 2060 or PRTM 2070 or PRTM 2200 or PRTM 3110.
- PRTM 3110 Therapeutic Recreation 3 (3)** Examination of the profession of therapeutic recreation by analyzing the history, philosophy, concepts, roles, and functions involved in the therapeutic recreation services. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 3170 Group Initiatives 3 (2)** Examination and development of initiative modalities used by therapeutic recreators to teach teamwork, problem-solving communication, goal setting, leadership and personal interaction to diverse populations in a variety of settings. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Coreq:* PRTM 3171.
- PRTM 3171 Group Initiatives Laboratory 0 (2)** Non-credit laboratory to accompany PRTM 3170. *Coreq:* PRTM 3170.
- PRTM 3180 Leisure Lifestyle Management 3 (3)** Examines principles and techniques applicable to guiding disabled as well as nondisabled individuals in an exploration of leisure needs, barriers, consequences, and accessibility. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 3200 Recreation Policymaking 3 (3)** Structures and processes for public park and/or recreation policy formation in the United States. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 3210 Recreation Administration 3 (3)** Analysis of the internal organization of a recreation department dealing with finances and accounting, records and reports, publicity and public relations, state and federal legislation, staff organization, coordination of community resources. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course.

- PRTM 3220 Facilitation Techniques in Recreational Therapy 3 (3)** Covers basic concepts, methods and techniques associated with the selection and implementation of therapeutic facilitation techniques and interventions for use in recreational therapy practice. *Preq:* PRTM 2600. *Coreq:* PRTM 3230 and PRTM 3240.
- PRTM 3230 Professional Preparation for Recreational Therapy Practice 3 (3)** Course is designed to prepare students for their recreational therapy field placement experience, as well as assist them in their preparation for job-seeking, job-attainment, and career development following graduation. This course provides the academic preparation necessary to ensure entry level skills and determine the preferred placement based on identification of recreational therapy students' career goals. *Preq:* PRTM 2600 and PRTM 2650. *Coreq:* PRTM 3220 and PRTM 3240.
- PRTM 3240 Assessment and Planning in Recreational Therapy 4 (4)** Provides the information and tools for the first two steps of the recreational therapy process: assessment and planning. Through this course, students develop the necessary skills to complete a comprehensive assessment of clients in a therapeutic environment, and develop an appropriate, evidence-based treatment plan. *Preq:* PRTM 2600. *Coreq:* PRTM 3220 and PRTM 3230.
- PRTM 3250 Global Perspectives in Leisure, Recreation and Tourism 3 (3)** Advanced topics in serving diverse populations in Parks, Recreation and Tourism Management, including lifespan, cultural and global perspectives, as well as other dimensions of diversity.
- PRTM 3260 Recreational Therapy Implementation and Evaluation: Physical Health Conditions 3 (3)** Examines the various health conditions and the role of recreational therapy in treatment settings for individuals with physical health conditions. In addition, students apply current recreational therapy implementation techniques and evaluation methods across physical health diagnoses and treatment settings. *Preq:* PRTM 3220 and PRTM 3240. *Coreq:* PRTM 3270 and PRTM 3280.
- PRTM 3270 Recreational Therapy Implementation and Evaluation: Mental Health Conditions 3 (3)** Examines the various health conditions and the role of recreational therapy in treatment settings for individuals with mental health conditions. In addition, students apply current recreational therapy implementation techniques and evaluation methods across mental health diagnoses and settings. *Preq:* PRTM 3220 and PRTM 3240. *Coreq:* PRTM 3260 and PRTM 3280.
- PRTM 3280 Preceptorship in Recreational Therapy 2 (4)** Course facilitates experiential learning opportunities for recreational therapy students consisting of preceptor-supervised clinical experiences in health care and community-based agencies. *Preq:* PRTM 3220 and PRTM 3240. *Coreq:* PRTM 3260 and PRTM 3270.
- PRTM 3300 Visitor Services and Interpretation 3 (3)** Introduces the philosophy and principles of the art of environmental interpretation. Comprehensive survey of interpretive theory as it applies to the recreation and parks practitioner and the varying settings within the profession. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 3420 Introduction to Tourism 3 (3)** Survey of travel and tourism in the United States with focus on terminology, demographics, financial significance, and trends. Includes Honors sections. Students must have a 2.0 cumulative grade-point ratio to enroll in this course.
- PRTM 3430 Spatial Aspects of Tourist Behavior 3 (3)** Spatial patterns of national and international leisure travel destinations are explored and analyzed regarding their tourism attractiveness. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 3440 Tourism Markets and Supply 3 (3)** Acquaints students with the principles of matching tourism markets and supply. Students examine the strategies used in developing markets. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 3450 Tourism Management 3 (3)** Examines the management issues associated with offering tourism products and experiences to travelers by the private and public sectors for the purpose of enhancing visitor opportunities, making a profit and affecting change in a destination.
- PRTM 3460 Heritage Tourism 3 (3)** Heritage is an important part of tourism and can be the focal point of many journeys. Students are introduced to key concepts and issues in heritage tourism, including management of heritage tourism resources, politics of heritage tourism and the relationship between heritage tourism and authenticity.
- PRTM 3470 Sport Tourism 3 (3)** Sport tourism is one of the largest and most important segments of the travel and tourism industry. With a focus on the global sports environment, course introduces students to the fundamentals of sport tourism, including the creation, impacts and future trends of sport tourism development.
- PRTM 3490 Survey of Tourism Sites 1 (3)** On-site study of various exemplary components of the travel and tourism industry in the Southeast. There are additional costs to students to cover travel. To be taken Pass/No Pass only. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* PRTM 3420 and Junior standing in Parks, Recreation and Tourism Management and consent of instructor.
- PRTM 3510 Risk Management and Certifications in Parks, Recreation and Tourism Management 3 (2)** Reviews basics of risk management relative to the administration of recreation programs. Certifies students in Red Cross Wilderness First Aid, First Aid for Sports, and CPR for the Professional Rescuer. *Coreq:* PRTM 3511.
- PRTM 3511 Risk Management and Certifications in Parks, Recreation and Tourism Management Laboratory 0 (2)** Non-credit laboratory to accompany PRTM 3510. *Coreq:* PRTM 3510.
- PRTM 3520 Camp Organization and Administration 3 (3)** Surveys the development and trends of camping in America. Considers programming for the operations of agency and private camps. Enables students to master the techniques of group living. Laboratory offers practical experience in camp craft including trips and outdoor cooking. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 3530 Foundations of Camp Counseling 3 (3)** Introduces concepts, principles and skills essential to personnel working within a camp context. Topics include supervising campers, interacting with campers, understanding the developmental needs of campers, and dealing with camper behavior. Group dynamics, leadership techniques and issues such as abuse are also discussed.
- PRTM 3540 Youth Development in Camp 3 (3)** Provides camp professionals with an understanding of concepts and theories in youth development relative to camp settings. Topics include the developmental needs of campers through various ages and stages, activity planning and structure, programming for individuals with disabilities or special medical needs, and creating positive youth development outcomes.
- PRTM 3550 Trends and Issues in Camp Management 3 (3)** Advanced course designed for students to examine the most current principles and practices in the organized camp profession. Topics include evaluation of programs, professional development, fund development, social media and research within a camp context.
- PRTM 3600 Recreation and Amateur Sport Management 3 (3)** Explores the theoretical foundations and basic skills, methods and techniques necessary for the effective design and delivery of recreational sport programs offered in public, not-for-profit, collegiate, and private agencies and organizations.
- PRTM 3610 Recreational Sport Facility and Venue Management 3 (3)** An overview of the management of recreational sport facilities and venues. Topics include in depth discussion and application of planning models, project management principles, financing capital projects, risk management and legal liability, and current issues and trends in facility and venue management.
- PRTM 3620 Programming and Trends in Community Sport 3 (3)** An overview of program development and issues and trends in community sport. This course outlines the development and evolution of community recreational sport programming to serve youth and adults.
- PRTM 3630 Programming and Trends in Campus Recreation 3 (3)** An overview of program development and issues and trends in campus recreation. This course outlines the development and evolution of campus recreation programming designed to serve the entire campus. Concentration areas in the field, professional opportunities, and the role of campus recreation are also covered.
- PRTM 3640 Programming and Trends in Intercollegiate Athletics 3 (3)** Current trends in intercollegiate athletics in the United States and abroad are identified and examined. Topics include programs, programming, organizational structure, education, policies, funding, governance and communication as they relate to intercollegiate athletics.

- PRTM 3650 Community Sport Practicum 3 (6)** Students gain practical experience in community-based recreational sport management to aid in discovery and application of PRTM core and recreational sport management course content within a municipal/community-based recreation agency or equivalent setting. To be taken Pass/No Pass only. *Preq:* PRTM 3600 and PRTM 3610 and PRTM 3620.
- PRTM 3660 Campus Recreation Practicum 3 (6)** Students gain practical experience in an area or areas of a campus recreation program to aid in discovery and application of PRTM core and recreational sport management course content. To be taken Pass/No Pass only. *Preq:* PRTM 3600 and PRTM 3610 and PRTM 3630.
- PRTM 3670 Intercollegiate Athletics Practicum 3 (6)** Students gain practical experience in an area of intercollegiate athletics, and apply knowledge gained in PRTM core courses and other recreation sport management courses in the field. *Preq:* PRTM 3600 and PRTM 3610 and PRTM 3640.
- PRTM 3800 Community Recreation in South Carolina 3 (1)** Students study indoor and outdoor recreation facilities, governmental jurisdiction, funding, programming, management, and staffing at community recreation agencies throughout South Carolina during a hands-on five-day field trip. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Coreq:* PRTM 3801.
- PRTM 3801 Community Recreation in South Carolina Laboratory 0 (4)** Non-credit laboratory to accompany PRTM 3800. *Coreq:* PRTM 3800.
- PRTM 3830 Golf Shop Operations 3 (3)** Provides students with the knowledge and skills necessary to succeed as managers of golf shops. Particular emphasis is on fundamental business planning, development of policies and procedures, merchandising, inventory control, pricing, and customer service. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* PRTM 2820.
- PRTM 3900 Independent Study in Parks, Recreation and Tourism Management 1-6 (1-6)** Comprehensive studies and investigation of special topics not covered in other courses. Emphasizes field studies, community service, and independent readings. May be repeated for a maximum of six credits. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* Junior standing and consent of instructor.
- PRTM 3910 Selected Topics in Parks, Recreation and Tourism Management 2-3 (2-3)** In-depth examination of developing trends in parks, recreation, and tourism that warrant timely study. May be repeated twice for a maximum of six credits, but only if different topics are covered. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* Junior standing.
- PRTM 3920 Special Event Management 3 (3)** Students acquire an in-depth knowledge about the field of special event management. Planning techniques, strategies, and requirements for planning, implementing, and evaluating community events are included. Emphasizes ordinances, planning, funding, and marketing. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 3950 Professional Golf Management Seminar III 2 (2)** Covers advanced teaching methods, golf club fitting, and player development programs. This course is designed to assist students in gaining the knowledge and skills necessary to successfully complete the PGA/PGM Training Program Level II. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* PRTM 2950.
- PRTM 3980 Creative Inquiry—Parks, Recreation and Tourism Management III 1-4 (1-3)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Coreq:* PRTM 3981.
- PRTM 3981 Creative Inquiry—Parks, Recreation and Tourism Management III Laboratory 0 (1-12)** Non-credit laboratory to accompany PRTM 3980. *Coreq:* PRTM 3980.
- PRTM 3990 Introduction to Field Training and Research (Honors) 1 (1)** For students pursuing departmental honors, provides an initial orientation to the internship and research requirements including identification of a faculty mentor to supervise these activities. *Preq:* PRTM 2070 and consent of instructor.
- PRTM 4020 Professional Golf Management Alternative Internship 3 (3)** Under the guidance of a qualified professional supervisor, students gain practical experience and apply knowledge acquired in the classroom to the workplace. May be repeated for a maximum of six credits. *Preq:* PRTM 2060 and PRTM 2070 and PRTM 4040; and Parks, Recreation and Tourism Management major in the Professional Golf Management Concentration; and approval of advisor.
- PRTM 4030 Elements of Recreation and Park Planning 3 (3)** Basic recreation and park planning principles, processes, and trends in area and facility development combine to form the basis for formulation of a relevant knowledge of planning. Students must have a 2.0 cumulative grade-point ratio to enroll in this course. *Preq:* Senior standing.
- PRTM 4040 Field Training I 1 (1)** Preparation for field training experience, including topics such as résumé development, interviewing techniques, internship agency selections, and responsibilities of the student, department, and agency. To be taken Pass/No Pass only. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* PRTM 2060 and consent of instructor. *Preq or concurrent enrollment:* PRTM 2070.
- PRTM 4050 Field Training II 6 (18)** Minimum ten weeks (400 hours) of uninterrupted, supervised work in a park, recreation or tourism management agency. Under agency supervision, students observe, organize, and implement activities, events, and programs. To be taken Pass/No Pass only. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* PRTM 2060 and PRTM 2070 and PRTM 4040; and Senior standing in Parks, Recreation and Tourism Management; and consent of instructor.
- PRTM 4070 Personnel Administration in Parks, Recreation and Tourism Management 3 (3)** Study of personnel administration practices in recreation agencies, including employee selection, training, motivation, rewards, evaluation, and legal issues related to personnel and supervision. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 4080 Honors Internship 6 (18)** Minimum of 4000 hours of uninterrupted, supervised work in a park, recreation, or tourism setting. Written report on observations, special project, or research is required in compliance with a contract between student and course instructor. *Preq:* PRTM 3990 and consent of instructor.
- PRTM 4090 Methods of Recreation Research I 3 (3)** Analysis of the principal methods of recreation research, the application of descriptive statistics to recreation research, and the development of a research proposal. Includes Honors sections. Students must have a 2.0 cumulative grade-point ratio to enroll in this course. *Preq:* PRTM 1980.
- PRTM 4100 Methods of Recreation Research II 3 (3)** Continuation of PRTM 4090; includes supervised execution and reporting of results of research proposal developed in PRTM 4090 and the application of inferential statistics to research. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* PRTM 4090 and consent of instructor.
- PRTM 4120 Therapeutic Recreation and Mental Health 3 (3)** Therapeutic recreation services in mental health clinics, institutions, and outdoor settings. Review of disorders and current modes of treatment as they relate to therapeutic recreation. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* PRTM 2600.
- PRTM 4160 Leisure and Aging 3 (3)** Examines the role of leisure services in later life, the needs of community-based and institutionalized elderly, and the development of service-delivery systems to meet those needs. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 4170 Therapeutic Recreation Processes I 4 (3)** Examination of models, principles, and procedures applicable to comprehensive program planning, specific program plans, individualized care plans, activity analysis, documentation, and evaluation. Students must have a 2.0 cumulative grade-point average and have completed three credit hours of human anatomy and physiology to enroll in this course. *Coreq:* PRTM 4171.
- PRTM 4171 Therapeutic Recreation Processes I Laboratory 0 (2)** Non-credit laboratory to accompany PRTM 4170. *Coreq:* PRTM 4170.
- PRTM 4180 Therapeutic Recreation Processes II 4 (3)** Examination of theories and concepts that guide therapeutic recreation interventions, including knowledge and use of communication skills, therapeutic relationships, counseling theories, and group processing techniques. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* PRTM 4170. *Coreq:* PRTM 4181.
- PRTM 4181 Therapeutic Recreation Processes II Laboratory 0 (2)** Non-credit laboratory to accompany PRTM 4180. *Coreq:* PRTM 4180.

- PRTM 4190 Therapeutic Recreation and Aspects of Disability Across the Lifespan 3 (3)** Examination of characteristics and diagnoses of individuals with various disabilities (cognitive, affective, and/or psychomotor domains) across the lifespan. Application of theories and concepts that guide therapeutic recreation interventions as well as examination of disability theory and concepts. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* PRTM 3110 and BIOL 2220 and BIOL 2230.
- PRTM 4200 Therapeutic Recreation Trends and Issues 3 (3)** Advanced principles and practices of therapeutic recreation, including philosophy, ethics, professional development, standards of practice, certification, recreation inclusion, and marketing services. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* PRTM 4160 and PRTM 4180.
- PRTM 4210* Recreation Financial Resources Management 3 (3)** Analysis of recreation financial resources management. Deals with revenue sources and their allocation. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* PRTM 2410.
- PRTM 4220 Management of Recreational Therapy Services 3 (3)** Presents the foundation for understanding the contemporary health care system, as well as developing systematic program design, implementation and management of recreational therapy services. Students achieve a comprehensive understanding of the insurance and reimbursement systems; relevant guidelines and standards related to health care organizations; the process of program development; and program management principles. *Preq:* PRTM 3260 and PRTM 3270 and PRTM 3280.
- PRTM 4260 Trends and Issues in Recreational Therapy 3 (3)** Capstone course provides insight into the contemporary issues in the recreational therapy profession. The course requires students to synthesize previous course content and experiential learning and appraise personal and professional philosophies to elucidate their role as an entry-level practitioner. *Preq:* PRTM 4220.
- PRTM (GEOG) 4300* World Geography of Parks and Equivalent Reserves 3 (3)** Major international patterns in the provision and use of urban and rural parks and recreation are examined. May also be offered as GEOG 4300. *Preq:* 2.0 cumulative grade-point average.
- PRTM 4310* Methods of Environmental Interpretation 3 (2)** Practice and instruction in the use of equipment and methods available to the interpreter in public contact work. Coaching in presentation and evaluation of live programs and in design, execution, and evaluation of mediated programs is the major emphasis. Programs are delivered to public audiences in the Clemson area. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* PRTM 3300 and Senior standing in Parks, Recreation and Tourism Management and consent of instructor. *Coreq:* PRTM 4311.
- PRTM 4311* Methods of Environmental Interpretation Laboratory 0 (3)** Non-credit laboratory to accompany PRTM 4310. *Coreq:* PRTM 4310.
- PRTM 4410* Commercial Recreation 3 (3)** Components of offering leisure services and products to the public by individuals, partnerships, and corporations for the purpose of making a profit. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 4440* Tour Planning and Operations 3 (3)** Provides the opportunity to understand the psychology of touring, with emphasis on packaged and group tours and how tours of different types and scale are planned, organized, marketed, and operated. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* PRTM 3420 and consent of instructor.
- PRTM 4450* Conference/Convention Planning and Management 3 (3)** Provides the opportunity to understand the problems of and solutions to conference and convention planning and management from both the sponsoring organization's and facility manager's perspectives. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 4460* Community Tourism Development 3 (3)** Provides a community-based perspective of organizational, planning, development, and operational needs for a successful tourism economy at the local level. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* PRTM 3420 and consent of instructor.
- PRTM 4470 Perspectives on International Travel 3 (3)** Using the United States as a destination, international travel patterns and major attractions are presented. Factors which restrain foreign travel to the United States are analyzed. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 4510 Seminar in Community Recreation, Sport and Camp Management 3 (3)** Capstone course of case studies applied to management issues focused on community recreation, sport and camp management. *Preq:* PRTM 2060 and PRTM 2070 and PRTM 4050.
- PRTM 4520 Campus Recreation 3 (3)** Study of the basic components required for administration of successful college union and intramural-recreation sport programs. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 4530 Sports Information and Event Management 3 (3)** Introduction to basic techniques, tools, and procedures associated with sports information and event management activities. Focuses on the application of sports information and event management activities building upon knowledge from personal interviews, selected readings, event management brochures and field experience. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 4540 Trends in Sport Management 3 (3)** Examination of trends in the sport management area that allows PRTM majors to obtain an updated knowledge base of the field. Students are able to relate their academic studies to the current trends, problems, and management strategies confronting and being used within the sport management industry. Students must have a 2.0 cumulative grade-point ratio to enroll in this course.
- PRTM 4550 Advanced Program Planning 3 (3)** Advanced recreation programming techniques with an emphasis on funding, outcome measurement, customer service, program development, marketing, specialized populations, and current trends and issues impacting the delivery of recreation programs. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* PRTM 2410.
- PRTM 4600 Leisure Across the Lifespan 3 (3)** Introduces students to ways in which leisure affects human development and human development affects leisure behavior. Students must have a 2.0 cumulative grade-point average to enroll in this course.
- PRTM 4740 Advanced Recreation Resources Management 3 (3)** Advanced topics in recreation resource management focusing on management strategies and techniques for addressing common resource and social problems in recreation resource management. Case studies and problem analysis are emphasized. Includes Honors sections. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* PRTM 2700 and Senior standing.
- PRTM 4830 Golf Club Management and Operations 3 (9)** Focuses on activities related to merchandising, purchasing and selling, inventory management, vendor selection, pricing strategies, strategies for monitoring sales and inventory related to financial control and customer service. Students are exposed to the responsibilities of a golf professional at a full-service golf club facility. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq or concurrent enrollment:* COOP 1040 and COOP 1050.
- PRTM 4900 Senior Independent Study 1-6 (1-6)** In cooperation with and under supervision of a faculty member, students develop and execute a field study or community project. May be repeated for a maximum of six credits. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* Senior standing and consent of instructor.
- PRTM 4950 Professional Golf Management Seminar IV 1 (1)** Covers golf shop merchandising and inventory management and supervising and delegating. Emphasizes topics covered in the PGA/PGM Training Program Level III checkpoint. Students must have a 2.0 cumulative grade-point average to enroll in this course. *Preq:* PRTM 3950.
- PRTM 4980 Creative Inquiry—Parks, Recreation and Tourism Management IV 1-4 (1-3)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of faculty member/mentor. *Coreq:* PRTM 4981.
- PRTM 4981 Creative Inquiry—Parks, Recreation and Tourism Management IV Laboratory 0 (1-12)** Non-credit laboratory to accompany PRTM 4980. *Coreq:* PRTM 4980.

PRTM 4990 Presentation of Honors Projects 1 (1)
Under direction of a faculty supervisor, students prepare and deliver oral presentations on projects that were carried out in honors sections of PRTM 4090 or 4100. *Preq:* PRTM 4090 or 4100; and consent of instructor.

PSYCHOLOGY

Professors: T.R. Alley, T.W. Britt, R.L. Campbell, L. Gugerty, B.M. King, R.M. Kowalski, J.A. McCubbin, D.D. Moore, J.W. Murdoch, E.R. Muth, C.C. Pagano, J.J. Pilcher, C.L.S. Pury, P.H. Raymark, *Chair;* R.R. Sinclair, B.R. Stephens, F.S. Switzer III, M.A. Taylor, R.A. Tyrrell; *Associate Professors:* E.G. Brainerd Jr., C. Cantalupo, C.H. Pak, P.J. Rosopa, H.M. Zinzow; *Assistant Professors:* M. Shuffler, L. Whitlock; *Senior Lecturer:* P.R. Alley, J. Jorgensen

PSYC 2010 Introduction to Psychology 3 (3)
Introduction to the study of behavior. Analysis of the biological bases of behavior, learning, thinking, motivation, perception, human development, social behavior, and the application of basic principles to more complex phenomena such as education, personal adjustment, and interpersonal relations. Includes Honors sections.

PSYC 2020 Introductory Psychology Laboratory 1 (2)
Major phenomena and methods of psychology are illustrated and investigated in a series of laboratory modules. Students also explore career and academic development issues.

PSYC 2500 Pursuing Happiness 3 (3)
Introduces psychological theories and principles used to study human behavior (methods, cognition, motivation, etc.). The concept of happiness is investigated as a psychological construct across cultures. Offered summer session only.

PSYC 2750 Applied Psychology and Transportation 3 (3)
Introduces psychological principles used to study human behavior (methodological, cognitive, perceptual, etc.). These psychological principles, in addition to ethical, legal, and societal perspectives, are applied to transportation issues.

PSYC 3060 Human Sexual Behavior 3 (3)
The subject of sexual behavior is approached from the psychophysiological, behavioral, and cultural points of view. Evolutionary, historical, and cross-cultural perspectives are considered.

PSYC 3090 Introductory Experimental Psychology 4 (3)
Introduction to the analysis of data from experimental and correlational research in psychology. Emphasizes the applications and logical nature of statistical reasoning. Laboratory periods stress the techniques of data analysis using microcomputers. *Preq:* PSYC 2010. *Coreq:* PSYC 3091.

PSYC 3091 Introductory Experimental Psychology Laboratory 0 (2)
Non-credit laboratory to accompany PSYC 3090. *Coreq:* PSYC 3090.

PSYC 3100 Advanced Experimental Psychology 4 (3)
Continuation of PSYC 3090. Focus is on techniques of empirical research (experiments, quasi-experiments, non-experimental research, etc.) that are widely used in psychology. Students design and carry out their own empirical research projects normally involving data collected from human participants. Extensive practice in the writing of reports is included. *Preq:* PSYC 2010 and PSYC 3090. *Coreq:* PSYC 3101.

PSYC 3101 Advanced Experimental Psychology Laboratory 0 (2)
Non-credit laboratory to accompany PSYC 3100. *Coreq:* PSYC 3100.

PSYC 3240 Physiological Psychology 3 (3)
Study of human neuroanatomy with emphasis on the function of the nervous and endocrine systems. Discusses the biological basis of behavior in its normal and abnormal dimensions. *Preq:* PSYC 2010.

PSYC 3250 Physiological Psychology Laboratory 1 (3)
Demonstrations and techniques of selected physiological procedures are presented to explain the principles discussed in PSYC 3240. *Preq:* PSYC 2010. *Preq or concurrent enrollment:* PSYC 3240.

PSYC 3300 Motivation 3 (3)
Various aspects of motivation are considered by studying physiological, emotional, and environmental influences on behavior. Orientation is empirical rather than theoretical with emphasis on pertinent research, applications, and measurement of motives. *Preq:* PSYC 2010.

PSYC 3330 Cognitive Psychology 3 (3)
Study of higher-order mental processing in humans. Topics include memory, learning of concepts, problem solving, and the psychology of language. *Preq:* PSYC 2010.

PSYC 3340 Laboratory in Cognitive Psychology 1 (2)
Selected experiments and demonstrations are conducted to reveal phenomena related to human perception, memory, reasoning, problem solving, and high-level mental processes. *Preq:* PSYC 2010 and PSYC 3090. *Preq or concurrent enrollment:* PSYC 3330.

PSYC 3400 Lifespan Developmental Psychology 3 (3)
Survey of current theory and research concerned with the psychological aspects of human growth and development across the entire lifespan. Major topics include developmental methods, physical maturation, cognition, socialization, personality, psycholinguistics, intelligence, learning, behavior problems, and exceptionality. Includes Honors sections. *Preq:* PSYC 2010.

PSYC 3440 Psychology of Adolescence 3 (3)
Study of the psychosocial processes of adolescence. Major emphasis is on personality development, growth of thinking, social and sexual maturation, and variations in adolescence. *Preq:* PSYC 2010.

PSYC 3450 Adulthood and Aging 3 (3)
Special consideration of the major psychological processes of aging as they relate to individual behavior and adaptation. Includes the influences of aging on the body, learning and psychomotor skills, thinking and intelligence, employment and productivity, personality, and psychopathology. Opportunity for contact with institutionalized and noninstitutionalized elderly persons is provided. *Preq:* PSYC 2010.

PSYC 3520 Social Psychology 3 (3)
Survey course analyzing human social behavior from the perspective of the individual as a participant in social relationships. Major emphasis is on the study of such contemporary social processes as attitude formation and change, interpersonal relations, conformity, conflict resolution, aggression and violence, social communication, and group phenomena. Includes Honors sections. *Preq:* PSYC 2010.

PSYC (ELE, SOC) 3560 Social Science of Entrepreneurship 3 (3)
Examines those areas of the social sciences that have direct relevance for entrepreneurs. Topics include processes by which entrepreneurs are shaped by social institutions such as the family and community, public policy implications and influences on entrepreneurship, risk perception, decision making, motivation, leadership, and group dynamics. May also be offered as ELE 3560 or SOC 3560. *Preq:* SOC 2010 or SOC 2020 or SOC 2350 or PSYC 2010 or POSC 1010 or POSC 1020 or POSC 1040.

PSYC 3640 Industrial Psychology 3 (3)
Reviews perception of work from the pre-industrial revolution to the present. Comparative approaches to motivation, development, maintenance, and attraction of successful work behaviors are discussed. Topics include the organization's responsibilities to the community, implementing a disease- and accident-free workplace, and the effects of consumerism. *Preq:* PSYC 2010.

PSYC 3680 Organizational Psychology 3 (3)
Analysis of individual behavior for the purpose of investigating problems in organizations and increasing organization effectiveness. Topics include psychological factors affecting communication, decision making, conflict, leadership, work stress, power, and organizational change. *Preq:* PSYC 2010.

PSYC 3690 Leadership in Organizational Settings 3 (3)
Broad survey of theory and research on leadership in formal organizations. A detailed explanation and critical evaluation of major theories (including participative and charismatic leadership) are bridged with helpful remedies and prescriptions for effective leadership in organizations. *Preq:* PSYC 2010.

PSYC 3700 Personality 3 (3)
Historical and contemporary views of individual differences in behavior, affect, health, coping, and motivation. Covers topics such as personality development and structure, personality assessment, cross-cultural issues, and applications of personality psychology. *Preq:* PSYC 2010.

PSYC 3830 Abnormal Psychology 3 (3)
Introduction to the diagnosis and treatment of mental illnesses. Uses current diagnostic standards for mental disorders as a framework for understanding the symptoms, causes, and treatments of the most commonly observed maladaptive behaviors. Includes Honors sections. *Preq:* PSYC 2010.

PSYC 3900 Honors Seminar in Psychology 3 (3)
Variable topic seminar for Honors students from all majors. Topics are announced prior to registration for each semester. May be repeated once for credit, but only if different topics are covered. *Preq:* PSYC 2010.

PSYC 4080 Women and Psychology 3 (3)
Explores the wide variety of psychological issues that concern women. Emphasizes empirical research on topics such as motherhood, sex differentiation, motivation, and psychological disorders. *Preq:* PSYC 2010.

PSYC 4150 Systems and Theories of Psychology 3 (3)
Study of the development of psychology, particularly during the past 1000 years. Emphasis is on giving students a better perspective of present-day psychology. Focus is on the various approaches taken by influential psychologists and the conflicts among these approaches. *Preq:* PSYC 2010.

- PSYC 4220 Sensation and Perception 3 (3)** Study of psychophysical techniques of measurement and sensory and perceptual processes related to vision, hearing, and the other senses. Includes Honors sections. *Prq:* PSYC 2010.
- PSYC 4230 Sensation and Perception Laboratory 1 (2)** Selected experiments are conducted to demonstrate the phenomena involved in sensation and perception. *Prq:* PSYC 3090. *Prq or concurrent enrollment:* PSYC 4220.
- PSYC 4260 Advanced Physiological Psychology 3 (3)** Advanced studies of the biological basis of behavior with emphasis on functional neuroanatomy and endocrinology. Topics may vary. May not be repeated for credit. *Prq:* PSYC 3240.
- PSYC 4350 Human Factors Psychology 3 (3)** Analyses of theoretical issues and research methods related to the interaction between people and machines and human performance. Topics include information processing theory, human control systems and displays, task simulation, perceptual and motor factors limiting human performance. *Prq:* PSYC 2010.
- PSYC 4430 Infant and Child Development 3 (3)** Cognitive, emotional, and social development from conception through childhood (up to age 12). Major theories and research findings are covered. *Prq:* PSYC 2010 and PSYC 3400.
- PSYC 4470 Moral Development 3 (3)** Explores the development of moral reasoning, judgment, and character from a descriptive psychological point of view. Examines the theoretical and empirical work of Jean Piaget, Lawrence Kohlberg, and Elliot Turiel as well as prosocial, eudaemonistic, and cross-cultural alternatives to these ideas. *Prq:* PSYC 2010; and one of PSYC 3400 or PSYC 3440 or PSYC 3450.
- PSYC 4560 Applied Psychophysiology 3 (3)** Explores the various measures used in psychophysiology to study mind-body interactions. Exposes students to the practice of psychophysiology through an integrated hands-on laboratory experience in which students learn about psychophysiological measures by applying them. *Prq:* PSYC 2010.
- PSYC 4710 Psychological Testing 3 (3)** Introduction to the theory of psychological testing, emphasizing the principles of measurement and psychometric characteristics of a good psychological test. Issues in test development, administration, and interpretation are reviewed. Educational, industrial, and clinical uses of tests are examined. *Prq:* PSYC 2010 and 3090.
- PSYC 4750 Brain and Behavior: An Evolutionary Approach 3 (3)** Examines the interactions between the human brain and behavior from an evolutionary perspective. Topics can include: hunger, stress, sleep, sexual attraction, memory, decision making, in-out groups, male-female interaction, and maladaptive behaviors. Includes Honors sections. *Prq:* PSYC 2010 and Junior or Senior standing.
- PSYC 4800* Health Psychology 3 (3)** Study of the role of health-related behaviors in the prevention, development and/or exacerbation of health problems. Emphasis on the biopsychosocial model and its application in the assessment, treatment, and prevention of health problems. *Prq:* PSYC 2010.
- PSYC 4820 Positive Psychology 3 (3)** Examines the research, theories, and applications of the psychology of human strengths and well-being. Fundamental research into the cultural, emotional, personality, cognitive/motivational, and developmental correlates of strengths and well-being is examined, as well as application of these principles to a variety of organizational settings. *Prq:* PSYC 2010.
- PSYC 4880 Theories of Psychotherapy 3 (3)** Survey of alternative theories of psychological treatment for behavioral and emotional disorders. Various theoretical assumptions, techniques, and applications of each approach are examined and compared, and case examples are considered. *Prq:* PSYC 3700 or PSYC 3830.
- PSYC 4890* Selected Topics 3 (3)** Seminar in current topics in psychology. Topics change from semester to semester and are announced prior to each semester's registration. May be repeated once for credit, but only if different topics are covered. *Prq:* PSYC 2010.
- PSYC 4900 Senior Division Honors Research I 2-4 (2-4)** Preparation and defense of a research proposal. Proposed project should be empirical, historical, or theoretical in nature. *Prq:* Junior standing and consent of instructor.
- PSYC 4910 Senior Division Honors Research II 2-4 (2-4)** Completion of the proposed research project resulting in a written thesis. *Prq:* PSYC 4900.
- PSYC 4920 Senior Laboratory in Psychology 1 (2)** Students complete an integrative review of topics in psychology in the context of producing a reflective portfolio. *Prq:* Senior standing.
- PSYC 4930 Practicum in Clinical Psychology 3 (1)** Students apply classroom theory in solving individual and community problems through interaction with community agencies and other professional groups in the mental health area. Students have limited but well-controlled contact with actual clinical problems as they occur in the community environment. *Prq:* PSYC 3830. *Coreq:* PSYC 4931.
- PSYC 4931 Practicum in Clinical Psychology Laboratory 0 (5)** Non-credit laboratory to accompany PSYC 4930. *Coreq:* PSYC 4930.
- PSYC 4950 Practicum in Applied Psychology 3 (1)** Students are provided practical experience in the area of applied psychology. Students usually are involved in a project designed to help solve an industrial problem through a direct application of industrial or social psychology. *Prq:* Consent of instructor. *Coreq:* PSYC 4951.
- PSYC 4951 Practicum in Applied Psychology Laboratory 0 (5)** Non-credit laboratory to accompany PSYC 4950. *Coreq:* PSYC 4950.
- PSYC 4970 Directed Studies in Psychology 1-4 (1-4)** Study under the direction of a faculty member of a particular topic agreed upon by the student and faculty member. May be repeated for a maximum of 12 credits. Includes Honors sections. *Prq:* Consent of instructor.
- PSYC 4980 Team-Based Research 1-4 (1-4)** Students conduct psychological research and learn about phases of the research process with a team of their peers under the direction of a faculty member. The collaborative nature of psychological research is emphasized. May be repeated for a maximum of 18 credits. Includes Honors sections. *Prq:* Consent of instructor.
- ## RELIGION
- Professor:* S.E. Grosby; *Assistant Professors:* E. Jemison, M. Saif, B.L. White; *Lecturers:* P.A. Cohen, R. Stephens
- REL 1010 Introduction to Religion 3 (3)** Study of the variety of religious experience and expression in human life.
- REL 1020 World Religions 3 (3)** Survey of major religious traditions of the world. Includes Honors sections.
- REL 3000 Studying Religion: Theories and Methods 3 (3)** Discussion- and presentation-based seminar in which students read the writings of the great theorists of religion since the eighteenth century. Social-scientific, phenomenological, and cultural approaches to the study of religion are explored. Basic methodologies and tools for studying religion are also introduced. *Prq:* Sophomore standing.
- REL 3010 The Old Testament 3 (3)** Survey of the books of the Old Testament with special consideration given to the development of the concepts, institutions, and theology of the ancient Hebrews.
- REL 3020 Survey of New Testament Literature 3 (3)** Study of the books of the New Testament from the standpoint of their occasion, content, literary form, and basic theology.
- REL 3030 The Quran 3 (3)** Survey of Islamic Scripture, its origins, content, and interpretation, with attention to the development of Hadith and Sunna as well.
- REL 3050 Constructing Scripture 3 (3)** Historical exploration of the development of Jewish and Christian scriptures. Emphasis is given to reading texts that were excluded from the Hebrew Bible and the New Testament and the role the canonical played in constructing "orthodoxy."
- REL 3060 Judaism 3 (3)** Examines the development of Judaism from biblical to modern times.
- REL 3070 The Christian Tradition 3 (3)** Examination of the development of Christianity in Western civilization from the post-New Testament period to the present, stressing institutional growth and changes, theological currents, and interaction of Christianity with culture.
- REL 3080 Religions of the Ancient World 3 (3)** Selected religious movements in ancient Mesopotamia, Egypt, Canaan, and the Greco-Roman world with emphasis on movements outside the Judeo-Christian tradition.
- REL (HIST) 3100 History of Religion in the United States 3 (3)** Development of religion in the U.S. from the Colonial period to the 20th century. Attention is devoted to analyzing the broad currents in religious movements and religious thought that have given shape to the American pluralistic experience. May also be offered as HIST 3100.
- REL 3110 African American Religion 3 (3)** Study of the religious milieu in the U.S. rooted in our African heritage. Background on African tribal religion is included, along with Christian denominations and new religions such as Nation of Islam, Rastafarianism, Voudun, Santeria, and Candomble.

- REL 3120 Hinduism 3 (3)** A study of the history, practices, ideas, and social institutions associated with the variety of Indian religious traditions commonly called "Hinduism" from their origins to the present.
- REL 3130 Buddhism 3 (3)** A study of the history, practices, ideas, and social institutions associated with the variety of Buddhist traditions found throughout the world. Discussion topics focus on the development of classical Buddhism in India and its expansion into Tibet, and includes a treatment of the distinctive developments in China and Japan.
- REL 3140 Buddhism in China 3 (3)** Study of Buddhism in Chinese history since the second century. Examination of the translation and interpretation of the texts, major Chinese Buddhist schools, monastic life, and the comprehensive influence of Buddhism on Chinese culture and society. All readings and discussions are in English.
- REL 3150 Islam 3 (3)** A study of the origins, development, and history of the religion of Islam and Islamic cultures from the time of the Prophet to the present.
- REL 3200 Jesus in History, Faith and Film 3 (3)** An investigation of the genre of ancient biography, the diverse portrayals of Jesus' life in early Christianity, and the post-Enlightenment "Quest for the Historical Jesus." The course also analyzes contemporary cinematic portrayals of Jesus's life as a way of further exploring the relationship between producer, social location, and constructions of the past. *Preq:* Sophomore standing.
- REL 3300 Contemporary Issues in Religion 3 (3)** Examination of a variety of issues of broad concern to scholars of religion today. Issues may vary. May be repeated for a maximum of six credits with departmental consent.
- REL (HIST) 3510 Ancient Near East 3 (3)** History of the peoples and civilizations of the Near East from the Sumerians to the establishment of Roman power in this region. Includes geography, mythology, religious, and economic currents as well as the methods and discoveries of archaeology. May also be offered as HIST 3510.
- REL (HIST) 3730 Age of the Protestant Reformation 3 (3)** Evolution of Modern Europe (ca. 1500-1660), as affected by the Reformation, wars of religion, and growth of nation-states. Study includes intellectual advances and the beginnings of European expansion overseas. May also be offered as HIST 3730.
- REL 3990 Junior Research Colloquium 3 (3)** Colloquium offered each spring for junior Religious Studies majors. Students enroll individually with a faculty member of their choice and develop, in consultation with him or her, a research project suited to the student's interests. All students meet four times as a group to present the discuss their research. *Preq:* Junior Religious Studies major.
- REL 4010* Studies in Biblical Literature and Religion 3 (3)** Critical examination of a selected topic in biblical studies. Topics vary from year to year. May be repeated once for credit.
- REL 4020* Studies in Religion 3 (3)** Thorough examination of a selected topic in one or more of the religious traditions of the world or of religious life in a particular region. Topics vary from year to year. May be repeated once for credit.
- REL 4100* Holy Lands 3-6 (3-6)** Rotating study abroad trips to areas of historical importance to Judaism, Christianity, Islam and other religious traditions. Students visit archaeological sites, museums, and sacred spaces of global importance and gain needed world-perspective as they encounter other cultures.
- REL (HIST) 4520* History of Early Christianity 3 (3)** Study of the history, social and doctrinal, of early Christianity up to 600 A.D. May also be offered as HIST 4520.
- REL 4900 Senior Seminar 3 (3)** Capstone-style seminar offered each fall for senior year Religious Studies majors, who conduct research, make presentations, and engage in weekly discussions on a topic chosen by the faculty member organizing the seminar. Course represents the final synthesis of skills developed throughout the major. *Preq:* Senior Religious Studies major.
- REL 4920 Creative Inquiry: Religion 1-4 (1-4)** Small group work is performed on particular issues with emphasis on involving students in research. Content varies. May be repeated for a maximum of nine credits. *Preq:* Consent of instructor.
- REL 4970 Religion Honors Research 3 (3)** Students conduct research, clearly define the topic, and complete an annotated bibliography under the supervision of thesis advisor. *Preq:* Consent of department chair and thesis advisor.
- REL 4980 Religion Honors Thesis 3 (3)** In consultation with thesis advisor and departmental thesis committee, students write, revise, defend, and complete their theses. *Preq:* REL 4970 and consent of department chair and thesis advisor.
- REL 4990* Independent Study 1-3 (1-3)** Study of selected problems, issues, or movements in religion under the direction of a faculty member chosen by the student. Student and faculty member develop an individualized course of study approved by the department chair prior to registration. May be repeated for a maximum of six credits. *Preq:* Consent of instructor.
- RURAL SOCIOLOGY**
Associate Professor: K.L. Robinson
- RS 3010 Rural Sociology 3 (3)** Study of human social relationships as influenced by life in the open country and in small towns and villages, including considerations of the rural population, rural social institutions, processes of change in agricultural technology, and community area planning and development.
- RS (SOC) 3030 Methods of Social Research I 4 (3)** Introduction to methods of social research: research design, sampling, measurement, reliability, and validity; the relationship between theory and research. Coordinating laboratory introduces students to computer literacy through research. Required of all Sociology majors. Includes Honors sections. May also be offered as SOC 3030. *Preq:* SOC 2010 and one of STAT 2300 or STAT 3300. *Coreq:* RS 3031.
- RS (SOC) 3031 Methods of Social Research I Laboratory 0 (3)** Non-credit laboratory to accompany RS 3030. May also be offered as SOC 3031. *Coreq:* RS 3030.
- RS (SOC) 4010* Human Ecology 3 (3)** Analysis of the interrelationships between the physical world, modifications in natural environments, human settlement patterns, and institutions that both encourage and regulate environmental modification. Emphasizes conditions whereby natural resources become public policy concerns. May also be offered as SOC 4010. *Preq:* Junior standing.
- RS (SOC) 4590* The Community 3 (3)** Close analysis of the development of contemporary communities and their place in society. Continuing effects of industrialization, migration, and technological change on community location and structure are examined. Structural relations of social class, status, and the associations among institutions are explored. May also be offered as SOC 4590. *Preq:* Junior standing.
- RS (SOC) 4950 Field Experience 3 (1)** Students participate in selected field placements under supervision for eight hours weekly and in a one-hour seminar per week. May be repeated once for credit. May also be offered as SOC 4950. *Preq:* SOC 2010 or SOC 2020; and Junior standing and consent of instructor. *Coreq:* RS 4951.
- RS (SOC) 4951 Field Experience Laboratory 0 (8)** Non-credit laboratory to accompany RS 4950. May also be offered as SOC 4951. *Coreq:* RS 4950.
- RS (SOC) 4980 Independent Study 1-3 (1-3)** Individual readings or projects in sociological areas not covered in other courses. A written proposal must be approved by the instructor directing the work and by the department chair prior to registration. May be repeated for a maximum of six credits. May also be offered as SOC 4980. *Preq:* Consent of instructor.
- RUSSIAN**
Professor: G.L. Love; *Lecturer:* J. Bridgwood
- RUSS 1010 Elementary Russian 4 (3)** Training in pronunciation, grammatical forms, and syntax with a view to giving the student the fundamentals necessary to hold simple conversations and to read simple Russian texts. *Coreq:* RUSS 1011.
- RUSS 1011 Elementary Russian Laboratory 0 (1)** Non-credit laboratory to accompany RUSS 1010. *Coreq:* RUSS 1010.
- RUSS 1020 Elementary Russian 4 (3)** Continuation of RUSS 1010. *Preq:* RUSS 1010. *Coreq:* RUSS 1021.
- RUSS 1021 Elementary Russian Laboratory 0 (1)** Non-credit laboratory to accompany RUSS 1020. *Coreq:* RUSS 1020.
- RUSS 2010 Intermediate Russian 3 (3)** Brief review of RUSS 1010 and 1020 with conversation, composition, and dictation, and the beginning of more serious reading of Russian prose in short stories and plays. Includes Honors sections. *Preq:* RUSS 1020. *Coreq:* RUSS 2011.
- RUSS 2011 Intermediate Russian Laboratory 0 (1)** Non-credit laboratory to accompany RUSS 2010. *Coreq:* RUSS 2010.
- RUSS 2020 Intermediate Russian 3 (3)** Conversation, composition, and dictation based on readings of more difficult Russian prose than in the earlier courses. Includes Honors sections. *Preq:* RUSS 2010. *Coreq:* RUSS 2021.

RUSS 2021 Intermediate Russian Laboratory 0 (1)
Non-credit laboratory to accompany RUSS 2020.
Coreq: RUSS 2020.

RUSS 2970 Creative Inquiry—Russian 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration.
Preq: Consent of faculty member.

RUSS 3050 Russian Conversation and Composition 3 (3) Practice in spoken Russian emphasizing vocabulary building, pronunciation, and comprehension. Written exercises promote accuracy. *Preq:* RUSS 2020.

RUSS 3070 Russian Civilization 3 (3) Introduction to significant elements of Russian civilization. Emphasis is on social, geographical, political, and artistic aspects of modern Russia. Taught in Russian. *Preq:* RUSS 2020.

RUSS 3400 Russian Culture of the Nineteenth Century 3 (3) Study of achievements in art, science, music, and literature in Russia during the 19th century. Taught in English.

RUSS 3600 Russian Literature to 1910 3 (3) Study of key texts in the modern literary tradition in Imperial Russia from Pushkin to Chekhov. Readings and lectures are in English.

RUSS 3610 Russian Literature Since 1910 3 (3) Study of key texts in modern Russian and Soviet literature with particular focus on Russian modernist movements and Socialist Realism. Readings and lectures are in English.

RUSS 3970 Creative Inquiry—Russian 1-4 (1-4) Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.

RUSS 3980 Directed Reading 1-3 (1-3) Directed study of selected works in Russian. May be repeated for a maximum of six credits. *Preq:* RUSS 2020.

RUSS 4600 Tolstoy and Dostoevsky 3 (3) Examines a selection of major works by Leo Tolstoy and Fyodor Dostoevsky with particular focus on their literary, political, and philosophical aspects as well as their importance within the modern European literary tradition. Readings and lectures are in English.
Preq: Junior standing.

RUSS 4970 Creative Inquiry—Russian 1-4 (1-4) Continuation of research initiated in RUSS 3970. Students complete their project and disseminate their research results. *Preq:* RUSS 3970.

SOCIOLOGY

Professors: M.T. Britz, D.K. Sturkie, B.J. Vander Mey, F.C. Mobley, W.M. Wentworth; *Associate Professors:* E.M. Granberg, *Chair;* W.H. Haller, Y. Luo, S.E. Winslow; *Assistant Professor:* A. Whitehead; *Senior Lecturers:* J.C. Holland, S. Southworth; *Lecturers:* M. Barr, J. Edwards, W.C. White

SOC 2010 Introduction to Sociology 3 (3) Sociological perspective: the study of contemporary groups, organizations, and societies in terms of human social behavior, social change, social structure, and social institutions. Includes Honors sections.

SOC 2020 Social Problems 3 (3) Social problems involving the family, education, health care, political and legal systems, economy, population, environment, community; and special problems associated with age, economics, racial status, and gender inequality.

SOC 2050 Introductory Sociology Laboratory 1 (3) Overview of major sociological fields. Examines core competencies and the Sociology major. Relevant career and academic development issues are investigated. E-portfolios are established and expanded. *Preq:* Sociology major. *Preq or concurrent enrollment:* SOC 2010 or SOC 2020.

SOC 2350 Introduction to Leadership 3 (3) Introduction to leadership in various organizational settings from a sociological perspective. Examines the concept of leadership, leadership traits, types of leadership, and the evolution of leadership behaviors in the 19th and 20th centuries.

SOC 3020 Social Research Methods I 3 (3) This course is the first in a two-semester methods sequence, and focuses on conceptual issues related to research design, and on examples of an array of data collection and analysis techniques. Topics include the research process, linking theory and methods, conceptualization and measurement, sampling, research design, and research ethics. *Preq:* SOC 2010 or SOC 2020. *Preq or concurrent enrollment:* SOC 2050.

SOC (RS) 3030 Methods of Social Research I 4 (3) Introduction to methods of social research: research design, sampling, measurement, reliability, and validity; the relationship between theory and research. Coordinating laboratory introduces students to computer literacy through research. Required of all Sociology majors. Includes Honors sections. May also be offered as RS 3030. *Preq:* SOC 2010 and one of STAT 2300 or STAT 3300. *Coreq:* SOC 3031.

SOC (RS) 3031 Methods of Social Research I Laboratory 0 (3) Non-credit laboratory to accompany SOC 3030. May also be offered as RS 3031. *Coreq:* SOC 3030.

SOC 3040 Social Research Methods II 4 (3) This course is the second in a two-semester methods sequence, and provides a brief review of research design and a concentrated focus on statistical analysis. Topics include organizing and coding data, indexes and scales, measures of central tendency and variability, and univariate, bivariate and multivariate statistics. Includes Honors sections. *Preq:* SOC 3020 and one of STAT 2300 or STAT 3090 or STAT 3300. *Coreq:* SOC 3041.

SOC 3041 Social Research Methods II Laboratory 0 (1) Non-credit laboratory to accompany SOC 3040. *Coreq:* SOC 3040.

SOC 3100 Marriage and Intimacy 3 (3) Examination of mate selection, living together, marital relations, family planning, conflict resolution, divorce and remarriage, later life adjustments, and singlehood as a lifestyle in the U.S. Includes Honors sections.

SOC 3110 The Family 3 (3) Introduction to the family as a social institution. Primary focus is on families in the U.S. with comparisons to other cultures. Topics include history of the family, trends in family formation and dissolution, division of labor, intergenerational relationships, family violence, and policy. Analyses of race, class, and gender are incorporated. Includes Honors sections. *Preq:* SOC 2010 or SOC 2020.

SOC 3300 Work and Occupations 3 (3) Introduces changes in the structure of work from preindustrial to postindustrial periods. Topics include the effects of stratification on career decisions, career paths and implications for life changes, social effects of scientific management of work, unionization, globalization, the rise of multinational corporations, and cross-cultural comparisons of management styles. *Preq:* SOC 2010 or SOC 2020.

SOC 3310 Urban Sociology 3 (3) Urbanization as a social process and related conditions of work, family structure, social mobility, crime, lifestyle, technology, and development of urban areas in the Third World. *Preq:* SOC 2010 or SOC 2020 and sophomore standing.

SOC 3500 Self and Society 3 (3) Social psychology from the sociological viewpoint. Examines interactional and group influences on such individual conditions as childhood and life-course development, language, emotions, motives, sexuality, deviance, and self-concept. *Preq:* SOC 2010 or SOC 2020 or PSYC 2010.

SOC 3510 Collective Behavior and Social Movements 3 (3) Spontaneous, transitory, and sporadic group behavior: crowds, panics, riots, fads, and social movements. *Preq:* SOC 2010.

SOC (ELE, PSYC) 3560 Social Science of Entrepreneurship 3 (3) Examines those areas of the social sciences that have direct relevance for entrepreneurs. Topics include processes by which entrepreneurs are shaped by social institutions such as the family and community, public policy implications and influences on entrepreneurship, risk perception, decision making, motivation, leadership, and group dynamics. May also be offered as ELE 3560 or PSYC 3560. *Preq:* SOC 2010 or SOC 2020 or SOC 2350 or PSYC 2010 or POSC 1010 or POSC 1020 or POSC 1040.

SOC 3600 Social Class and Poverty 3 (3) Overview of economic stratification and inequality. Topics include measuring and explaining inequality, how inequality is reproduced in society, and the consequences for life outcomes. Course also focuses on poverty, including its nature, causes, demographics and consequences. *Preq:* SOC 2010 or SOC 2020.

SOC 3800 Introduction to Social Services 3 (3) Fundamentals of casework practice, including philosophy and values, models of group work, and ethics in social services work. *Preq:* SOC 2010 or SOC 2020.

SOC 3880 The Criminal Justice System 3 (3) Social systems analysis of criminal justice agencies. Primary focus is on law enforcement and corrections and their interagency relationship with courts and prosecution.

SOC 3890 Criminology 3 (3) Study of nature and causes of criminal behavior; societal attempts to control crime; social responses to crime, criminals, and the criminal justice system.

SOC 3910 Sociology of Deviance 3 (3) Study of patterns of deviant behavior: subcultures, careers, and life-styles of deviants; deviance theory and research. *Preq:* SOC 2010 or SOC 2020.

SOC 3920 Juvenile Delinquency 3 (3) Study of nature, extent, and causes of juvenile delinquency; societal attempts to control delinquent conduct and gang violence; emergence of the juvenile justice system. *Preq:* SOC 2010 or SOC 2020.

- SOC 3940 Sociology of Mental Illness 3 (3)** Mental illness as a social phenomenon, including cultural and social influence, organizational settings of mental health-care delivery, legal issues, patient-therapist relationships, and mental illness intervention as social control. Includes Honors sections.
- SOC 3970 Substance Abuse: Social Causes, Consequences and Treatment 3 (3)** Examination of the history and impact of substance use in our culture, from a sociological perspective. Topics include the various reasons individuals and groups partake of drugs and alcohol, our cultural obsession with substances, theories regarding addiction, drug and alcohol control policy and benefits and costs of substance use. *Preq:* SOC 2010 or SOC 2020.
- SOC 3980 Computer Crime 3 (3)** Traces the history of technological crime and evaluates forensic practices in light of legislation with an analysis of emerging case law. Addresses guidelines for the development of forensic laboratories, the creation of computer crime task forces, search/seizure of electronic equipment, and the evaluation of criminal subcultures. *Preq:* SOC 3880.
- SOC (RS) 4010* Human Ecology 3 (3)** Analysis of the interrelationships between the physical world, modifications in natural environments, human settlement patterns, and institutions that both encourage and regulate environmental modification. Emphasizes conditions whereby natural resources become public policy concerns. May also be offered as RS 4010. *Preq:* Junior standing.
- SOC 4030 Technology, Environment, and Society 3 (3)** Considers issues involved in science, technology, and the environment in relation to human behaviors and values with an emphasis on the U.S. and globalized world contexts. Surveys the sociology of environment, science, and technology. Includes selected analysis of related controversies and policy considerations. *Preq:* SOC 2010 or SOC 2020.
- SOC 4040* Sociological Theory 3 (3)** Survey of the development of sociological theory. Required of all Sociology majors. *Preq:* SOC 2010 or SOC 2020; and Junior standing.
- SOC 4080 Honors Thesis Research I 3 (3)** Reading and research related to senior honors thesis. Completion of junior honors requirements and approval of department chair and thesis advisor required. *Preq:* Honors status and SOC 3020.
- SOC 4090 Honors Thesis Research II 3 (3)** Research and writing related to the senior honors thesis. *Preq:* Honors status and honors section of SOC 3040 and SOC 4080.
- SOC 4140* Policy and Social Change 3 (3)** Uses the sociological perspective to examine policy development, implementation, and evaluation in the public and private sectors. Specifically, focuses on values and ethics and effects of social change efforts on the outcomes of policy formation, social planning, and implementation. *Preq:* SOC 2010 or SOC 2020; and Junior standing.
- SOC 4300 Sociology of Organizations 3 (3)** Analysis of administrative organizations and voluntary associations; applied analysis of their formal and informal group relations, communications, and effectiveness. *Preq:* SOC 2010 or SOC 2020 and Junior standing.
- SOC 4320 Sociology of Religion 3 (3)** Sociological analysis of religious systems and movements and their influence on other social institutions. *Preq:* SOC 2010 or SOC 2020 and Junior standing.
- SOC 4330* Globalization and Social Change 3 (3)** Examination of the social and historical causes of development and underdevelopment. Various sociological theories of development are reviewed. Selected countries are examined in an international context. *Preq:* SOC 2010 or SOC 2020 and Junior standing.
- SOC 4440 Sociology of Education 3 (3)** Examines the relationship between education and society. Topics include theoretical perspectives, school organization, social mobility and stratification in schools, race and gender, tracking and school reform. *Preq:* SOC 2010 or SOC 2020 and Junior standing.
- SOC 4500 Sociology of Groups and Group Processes 3 (3)** Sociological perspectives on groups, group dynamics and group performance. Topics include status, power, justice, legitimacy and leadership. *Preq:* SOC 2010 or SOC 2020 or PSYC 2010.
- SOC (RS) 4590* The Community 3 (3)** Close analysis of the development of contemporary communities and their place in society. Continuing effects of industrialization, migration, and technological change on community location and structure are examined. Structural relations of social class, status, and the associations among institutions are explored. May also be offered as RS 4590. *Preq:* Junior standing.
- SOC 4600* Race and Ethnicity 3 (3)** Investigation of sociological perspectives on race, ethnic relations, and social stratification. Includes analysis of the impact of social class on minority movements. *Preq:* SOC 2010 or SOC 2020 and Junior standing.
- SOC 4610 Sociology of Sex and Gender 3 (3)** Examination of theoretical and empirical approaches to the sociology of sex and gender, focusing primarily on contemporary American society. Focuses on how gender intersects with race, ethnicity, social class and sexuality, and how major institutions in society are sites for the maintenance and reproduction of gender roles, expectations and differentiation. Includes Honors sections. *Preq:* SOC 2010 or SOC 2020 and Junior standing.
- SOC 4620 Men, Masculinity, and Society 3 (3)** Consideration of masculinity and social order: norms, roles, relationships, and activities; identity and socialization: work, family, sexuality, war, sports, including subcultural comparisons. *Preq:* SOC 2010 or SOC 2020 and Junior standing.
- SOC 4680 Sociology of Criminal Evidence 3 (3)** Introduction to the types of evidence, collection of evidence, chain of custody, and procedures relating to the introduction of evidence into judicial proceedings. Attention is given to Fourth Amendment constitutional issues, the development of law within American boundaries, and the cross-cultural development of law. *Preq:* SOC 3880.
- SOC 4710* Population Issues and Methods 3 (3)** Study of demographic concepts, theory, and research methods for vital statistics, migration, and population distribution and projections. Considers collection and processing of demographic data and organization of demographic data systems. Includes Honors sections. *Preq:* ANTH 2010 or RS 3010 or SOC 2010 or SOC 2020.
- SOC 4800* Medical Sociology 3 (3)** Study of socio-cultural factors in the etiology and treatment of physical illness, medical occupations and professions, and the organization of health care delivery systems. *Preq:* SOC 2010 or SOC 2020 and Junior standing.
- SOC 4810* Aging and Death 3 (3)** Sociological orientation to aging populations focusing on the impact of health care, welfare, and retirement systems. Includes dying as a social phenomenon, suicide, euthanasia, and funerals. *Preq:* SOC 2010 or SOC 2020 and Junior standing.
- SOC 4840* Child Abuse and Treatment 3 (3)** Comprehensive examination of child abuse, neglect, and exploitation as major social problems; causes, effects, and prevalence of physical, sexual, and emotional maltreatment; definitional controversies; social policy and legal considerations; therapeutic approaches for children and their caretakers; child maltreatment and the judicial system. *Preq:* Junior standing.
- SOC 4860 Creative Inquiry—Sociology 1-3 (1-3)** Investigates topics and engages in action research projects selected by faculty and students. Goals, research, activities, and outcomes vary from semester to semester and project to project. May be repeated for a maximum of 12 credits. *Preq:* Consent of instructor.
- SOC 4910* The Sociology of Policing 3 (3)** Introduction to the major issues of contemporary policing in the U. S. from a sociological perspective. Topics include the changing functions and structure of policing, the police subculture, and the role of the police in a liberal democracy. *Preq:* SOC 3880.
- SOC 4930* Sociology of Corrections 3 (3)** Analysis of correctional alternatives. Topics include sentencing strategies and their impact, prison populations (male, female, and juvenile), inmate social structures, treatment and custody issues, community-based alternatives (probation, parole, electronic monitoring, and work release), and correctional management issues. *Preq:* SOC 3880.
- SOC 4940* Sociology of Organized Crimes 3 (3)** Examines the multifarious aspects of criminal organizations, namely their structure, methods, and networks. Specific topics may include white-collar crime and traditional, nontraditional, and transnational organized crime. *Preq:* SOC 3880.
- SOC (RS) 4950 Field Experience 3 (1)** Students participate in selected field placements under supervision for eight hours weekly and in a one-hour seminar per week. May be repeated once for credit. May also be offered as RS 4950. *Preq:* SOC 2010 or SOC 2020; and Junior standing; and consent of instructor. *Coreq:* SOC 4951.
- SOC (RS) 4951 Field Experience Laboratory 0 (8)** Non-credit laboratory to accompany SOC 4950. May also be offered as RS 4951. *Coreq:* SOC 4950.
- SOC 4970 Sociology Senior Laboratory 1 (3)** Concludes overview of theory, research, methodology, and fields of sociology. Students add to and finalize complete portfolio, and prepare for post-degree careers and major field test. Students must have a 2.0 cumulative grade-point ratio to enroll in this course. *Preq:* SOC 2050 with a passing grade and Senior standing.

SOC (RS) 4980 Independent Study 1-3 (1-3)

Individual readings or projects in sociological areas not covered in other courses. A written proposal must be approved by the instructor directing the work and by the department chair prior to registration. May be repeated for a maximum of six credits. May also be offered as RS 4980. *Preq:* Consent of instructor.

SOC 4990 Seminar in Selected Topics in Contemporary Sociology 3 (3)

Sociological areas of current interest are explored. May be repeated by special arrangement for a maximum of six credits. *Preq:* SOC 2010 or SOC 2020.

SPANISH

Professor: Salvador Oropesa, *Chair*; *Associate Professors:* M. M. Rojas-Massei, D. Smith, G. E. Tissera; *Assistant Professors:* R. Anido, T. D. Miller, G. Palacios; *Lecturers:* K. Carson, S. K. Harris, F. Mares Hernandez, J. D. Martin Armas, H. Montes, M. Persico, C. A. Robison, E. Schmucker, R. K. Simpson, R. Tremolada, A. Whitehouse, M. Zamora

SPAN 1010 Elementary Spanish 4 (3)

Course for students with no previous experience in Spanish study. The fundamentals of grammar and vocabulary are taught, and a foundation is provided for building oral and written proficiency. Three hours a week of classroom instruction and one hour a week in the language laboratory. *Coreq:* SPAN 1011.

SPAN 1011 Elementary Spanish Laboratory 0 (1)

Non-credit laboratory to accompany SPAN 1010. *Coreq:* SPAN 1010.

SPAN 1020 Elementary Spanish 4 (3)

Continuation of SPAN 1010. *Coreq:* SPAN 1021.

SPAN 1021 Elementary Spanish Laboratory 0 (1)

Non-credit laboratory to accompany SPAN 1020. *Coreq:* SPAN 1020.

SPAN 1040 Basic Spanish 4 (3)

Condensed first-year course for students who have previously studied Spanish. Upon completion, students are prepared to enter Intermediate Spanish. *Coreq:* SPAN 1041.

SPAN 1041 Basic Spanish Laboratory 0 (1)

Non-credit laboratory to accompany SPAN 1040. *Coreq:* SPAN 1040.

SPAN 1510 Spanish for Graduate Students 3 (3)

Intensive program only for graduate students preparing for the reading examination in Spanish. A minimum grade of B on a final examination will satisfy graduate school foreign language requirement. May be repeated once. To be taken Pass/No Pass only. *Preq:* Graduate standing.

SPAN 2010 Intermediate Spanish 3 (3)

Intermediate course to practice listening, speaking, reading, and writing. Grammatical structures and basic vocabulary are reviewed systematically. Includes literary and cultural perspectives. Includes Honors sections. *Preq:* SPAN 1020. *Coreq:* SPAN 2011.

SPAN 2011 Intermediate Spanish Laboratory 0 (1)

Non-credit laboratory to accompany SPAN 2010. *Coreq:* SPAN 2010.

SPAN 2020 Intermediate Spanish 3 (3)

Continuation of SPAN 2010. Includes Honors sections. *Preq:* SPAN 2010. *Coreq:* SPAN 2021.

SPAN 2021 Intermediate Spanish Laboratory 0 (1)

Non-credit laboratory to accompany SPAN 2020. *Coreq:* SPAN 2020.

SPAN 2210 Accelerated Spanish II 6 (6) Accelerated intermediate course that may be taken in lieu of SPAN 2010 and 2020. Through conversation, composition, dictation, and intensive grammar review, proficiency is stressed. Includes literary readings and cultural perspectives. May not be taken by students who have completed SPAN 2010 or 2020. *Preq:* SPAN 1020.

SPAN 2970 Creative Inquiry—Spanish 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Arrangements with faculty members must be established prior to registration. *Preq:* Consent of faculty member.

SPAN 3020 Intermediate Spanish Grammar and Composition 3 (3) Intensive review of Spanish structure, verbs, idioms, and vocabulary with an introduction to syntax and stylistics through controlled and free composition. *Preq:* SPAN 2020.

SPAN 3040 Introduction to Hispanic Literary Forms 3 (3) Introduction to the basic structures and elements of fiction, poetry, drama, and essay, including literary and critical theory, with readings in 19th and 20th-century Spanish and Spanish-American literature. *Preq:* SPAN 3020 or SPAN 3050.

SPAN 3050 Intermediate Spanish Conversation and Composition I 3 (3) Practice in spoken Spanish with emphasis on vocabulary, pronunciation, intonation, and comprehension. Includes written work to increase accuracy and assignments in the language laboratory. *Preq:* SPAN 2020.

SPAN 3060 Spanish Composition for Business 3 (3) Intensive practice of business writing skills through compositions, general review of grammatical structures, and exposure to business vocabulary and concepts. *Preq:* SPAN 2020.

SPAN 3070 The Hispanic World: Spain 3 (3) Introduction to the significant aspects of the culture of Spain from its origins to the present. Emphasizes the artistic, social, historical, political, and contemporary issues of the Iberian Peninsula. *Preq:* SPAN 2020.

SPAN 3080 The Hispanic World: Latin America 3 (3) Introduction to the significant aspects of the culture of Spanish-American countries. Emphasis is placed on the development of the political, economical, geographical, social, and artistic aspects of Spanish America from the indigenous period to the present. *Preq:* SPAN 2020.

SPAN 3090 Introduction to Spanish Phonetics 3 (3) Study of basic concepts of phonetics and phonology, fundamental principles of Spanish pronunciation and International Phonetic Alphabet. *Preq:* SPAN 2020.

SPAN 3100 CLIP Summer Immersion Program 6 (6) Conducted entirely in Spanish for eight hours daily. Consists of activities that combine interrelating cultural topics with language skill practice. Frequent opportunities to converse with native speakers during meals and on excursions. Students receive six credits, three of which may be taken in lieu of SPAN 2020. *Preq:* SPAN 2010.

SPAN 3110 Survey of Spanish-American Literature 3 (3) Literary movements, influences, authors, and works from the Colonial period to the present. *Preq:* Six credits in Spanish at the 3000 level, including at least one course in literature or culture.

SPAN 3130 Survey of Spanish Literature I 3 (3) Literary movements, influences, and authors from the beginning to the end of the 17th century; representative works, discussions. *Preq:* Six credits in Spanish at the 3000 level, including three credits of literature or culture.

SPAN 3140 Hispanic Linguistics 3 (3) Familiarizes students with the theory and practice of linguistics applied to Spanish, in order to deepen their knowledge of phonetics, morphology, syntax, semantics and linguistic change. *Preq:* SPAN 3020.

SPAN 3160 Spanish for International Trade I 3 (3) Introduction to commercial Spanish; study of the spoken and written language, protocol, and cultural environment of the Spanish-speaking business world. Business vocabulary, basic business and cultural concepts, and situational practice. Reading and analysis of commercial texts. *Preq:* Two 3000-level Spanish language, literature, or culture courses.

SPAN 3180 Spanish Through Culture 3 (3) Topic-generated conversation course in Spanish through a broad array of artistic manifestations in the Hispanic World emphasizing conversation and short written exercises. Focuses on one Hispanic culture topic which provides a basis for class discussion and short written compositions in Spanish. *Preq:* One 3000-level course in Spanish.

SPAN 3820 Spanish-Language News 1 (1) Weekly discussions of Spanish-language news articles in the foreign press with an emphasis on politics and on the connections among political, economic, social, and cultural trends. Emphasizes Spanish vocabulary as well as cross-cultural contrasts with the United States. May be repeated for a maximum of three credits. *Preq:* SPAN 2020.

SPAN 3910 Honors Introduction to Hispanic Literary Forms I (1) One-hour independent study to allow honors students to pursue supervised research on some aspect of Hispanic literature. *Preq:* Membership in Calhoun Honors College.

SPAN 3920 Survey of Spanish Literature (Honors) 1 (1) Independent study allowing honors students to pursue supervised research on witchcraft in 15th and 16th-century Spain. *Preq:* Membership in Calhoun Honors College. *Preq or concurrent enrollment:* SPAN 3130.

SPAN 3930 The Hispanic World: Latin America (Honors) 1 (1) One-hour independent study to allow honors students to pursue supervised research on a topic related to Hispanic American history, politics, geography, economics, social institutions, or artistic movements. *Preq:* Membership in Calhoun Honors College. *Preq or concurrent enrollment:* SPAN 3080.

SPAN 3970 Creative Inquiry—Spanish 1-4 (1-4) Students focus on a special research area under the guidance of a faculty member. After acquiring the requisite background, students formulate hypotheses for a group project, develop a critical framework, and initiate research on a specific topic.

SPAN 3980 Directed Reading 1-3 (1-3) Directed study of selected topics in Spanish literature, language, and culture. May be repeated for a maximum of six credits. *Preq:* Consent of department chair.

- SPAN 4010 New Spanish Fiction 3 (3)** Study of selected readings by popular emerging and established authors of Spain, with emphasis on current cultural trends. Readings include, but are not limited to, detective novels, regional fiction, and fiction from marginalized groups in Spain. *Prq:* SPAN 3000-level literature course.
- SPAN 4030 Spanish American Women Writers 3 (3)** In-depth study of selected literary works by Spanish American women. Representative authors are studied within their philosophical and sociopolitical contexts. *Prq:* Spanish 3000-level literature course.
- SPAN 4040 Nineteenth and Twentieth Century Spanish Literature 3 (3)** Selected readings from major authors in Spain. Emphasis is on readings in poetry, theatre, short story, and novels from the 19th to the early 20th century. *Prq:* Spanish 3000-level literature course.
- SPAN 4050 International Trade, Film, and Literature 3 (3)** Readings and films on the social, economic, and political changes of the Hispanic world. *Prq:* Spanish 3000-level literature or culture course.
- SPAN 4060 Hispanic Narrative Fiction 3 (3)** Topic-generated readings from Spanish America and/or Spain. Readings consider gender issues, the family, ethnicity, religion, politics, history, or socioeconomic issues in the Hispanic world. *Prq:* Spanish 3000-level literature or culture course.
- SPAN 4070 Hispanic Film 3 (3)** Films are read as texts that mirror Hispanic society. Besides learning about cinematographic techniques in Spanish, topics include comparative analysis of film and literature, film as propaganda, film as blockbuster, and the cinematic depiction of social, cultural, and historical realities of Hispanic nations. *Prq:* Spanish 3000-level language, literature, or culture course.
- SPAN 4090 Comprehensive Writing in Spanish 3 (3)** Study of stylistics in addition to grammar review; writing paragraphs, short compositions, and creative papers in Spanish on both fiction and non-fiction topics. *Prq:* Any 3000-level Spanish course.
- SPAN 4110 Advanced Spanish Conversation and Composition 3 (3)** Continuation of SPAN 3050 with emphasis on greater fluency and sophistication in oral and written expression. *Prq:* SPAN 3050.
- SPAN 4150 Spanish for Health Professionals 3 (3)** Medical concepts and terminology in Spanish; designed for students who plan to work in professions related to public health care. *Prq:* Six credits in Spanish at the 3000 or 4000 level.
- SPAN 4160 Spanish for International Trade II 3 (3)** Study of more complex business vocabulary, cultural concepts, and environment of Hispanic markets. Social, political, and economic issues related to Spanish-speaking countries and their current economies in global marketing. Economic geography of Hispanic countries, company organization, management, banking, investment, goods and services, and marketing. *Prq:* SPAN 3160.
- SPAN 4170 Professional Communication 3 (3)** Skill-oriented course, taught in a seminar format. Students learn established protocol for addressing various Spanish-speaking audiences and learn to give professional presentations in Spanish. *Prq:* Spanish 3000-level course.
- SPAN 4180 Technical Spanish for Health Management Professionals 3 (3)** Technical health communication course in Spanish with emphasis on managerial and business aspects of the international health industry. *Prq:* SPAN 4150 and six additional credits in Spanish at the 3000 or 4000 level.
- SPAN 4190 Health and the Hispanic Community 3 (3)** Study of cultural aspects of health and health services in Hispanic populations. Taught in Spanish. *Prq:* Six credits in Spanish at the 3000 or 4000 level.
- SPAN 4200 Hispanic Drama 3 (3)** Exploration of contemporary Hispanic theatre. The production and reception of the plays are analyzed paying particular attention to notions of dramatic genre. Focuses on the change and continuity of the plays as well as their historical, cultural, and ideological backgrounds. *Prq:* Two 3000-level Spanish literature or culture classes.
- SPAN 4210 Spanish-American Modernism and Postmodernism 3 (3)** In-depth study of Spanish-American modernism and postmodernism with focus on narrative and poetry. *Prq:* Any 3000-level Spanish literature course.
- SPAN 4220 The Contemporary Spanish-American Novel 3 (3)** New trends in the development of the Spanish-American novel from the 1940s to the present. *Prq:* Spanish 3000-level literature course.
- SPAN 4230 Advanced Topics in Hispanic Linguistics 3 (3)** Continuation of SPAN 3140 with advanced topics. May be repeated for a maximum of six credits, but only if different topics are covered. *Prq:* SPAN 3140.
- SPAN 4350 Contemporary Hispanic Culture 3 (3)** Study of social, political, economic, and artistic manifestations of contemporary Hispanic culture. *Prq:* Spanish 3000-level civilization or culture course.
- SPAN 4380 Spanish Honors Research 3 (3)** Individual honors research conducted under the direction of Language Department faculty. May not be used to satisfy requirements for the major in Modern Languages–Spanish or Language and International Trade or the minor in Modern Languages. *Prq:* Junior standing and membership in Calhoun Honors College.
- SPAN 4390 Spanish Honors Thesis 3 (3)** Individual honors research conducted and thesis completed under the direction of Language Department faculty. May not be used to satisfy requirements for the major in Modern Languages–Spanish or Language and International Trade or the minor in Modern Languages. *Prq:* Junior standing and SPAN 4380 and membership in Calhoun Honors College.
- SPAN 4910 Hispanic Narrative Fiction (Honors) 1 (1)** One-hour independent study to allow honors students to pursue supervised research on the socio-political climate under Franco's dictatorship, with emphasis on contemporary literary theory. *Prq:* Membership in Calhoun Honors College. *Prq or concurrent enrollment:* SPAN 4060.
- SPAN 4920 Contemporary Latin American Novel (Honors) 1 (1)** One-hour independent study to allow honors students to pursue supervised research in the literary and cinematographic images of magic realism. *Prq:* Membership in Calhoun Honors College. *Prq or concurrent enrollment:* SPAN 4220.
- SPAN 4970 Creative Inquiry—Spanish 1-4 (1-4)** Continuation of research initiated in SPAN 3970. Students complete their project and disseminate their research results. *Prq:* SPAN 3970.
- SPAN 4980 Independent Study 1-3 (1-3)** Directed study of selected topics in Spanish language, literature, and culture. May be repeated for a maximum of six credits. *Prq:* Consent of department chair.
- SPAN 4990* Special Topics 3 (3)** Study of timely or special topics in Spanish. May be repeated for a maximum of six credits, but only if different topics are covered. *Prq:* Consent of department chair.

EXPERIMENTAL STATISTICS

Professors: W.P. Adams, J.R. Brannan, W.C. Bridges, Jr., N.J. Calkin, C.L. Cox, V.J. Ervin, X. Gao, P.D. Gerard, H.S. Hill, Jr., P.C. Kiessler, K.B. Kulasekera, R.B. Lund, G.L. Matthews, W.F. Moss III, J.R. Rieck, D.R. Shier, R.L. Taylor, Chair; D.D. Warner, M.M. Wiecek; *Associate Professors:* J. Brown, E.S. Dimitrova, C.M. Gallagher, W. Goddard, J.A. Hoffacker, K.L. James, E.W. Jenkins, T.R. Khan, H.K. Lee, H. Maharraj, C. Park, J.K. Peterson, L. Rebholz, M.J. Saltzman, X. Sun, C.L. Williams; *Assistant Professors:* P. Belotti, J. Dogbey, B.H. Fralix, Z.S. Hazari, J. Luo, M. Macaulley, C.S. McMahan, M. Mitkovski, G.D. Potvin, S. Poznanovikj, M.J. Schmoll, J.L. Sharp, A. Tyminski, H. Xue, J.R. Yoon; *Senior Lecturers:* S.S. Biggers, M.E. Cawood, J.E. Cottingham, T.A. Johnson, R.M. Martinez-Dawson, J.I. McKnew, B.A. Novick, S.A. Prevost, M.A. Reba, D.M. Simms, I.V. Viktorova; *Lecturers:* N. Bannister-Sinwell, E.H. Breazel, R.E. Davidson, C.A. Davis, R.S. Dubsy, E. Gallagher, A.A. Guest, J.M. Hanna, M.L. Hanna, Jr., N. Hubing, J.B. Lassiter, D.A. Moss, J. R. Newton, T.F. Parrott, M. Rios-Adams, L.J. Shick, A.K. Stoddard, T.C. Teitloff, J. Van Dyken, S.E. Walker; *Visiting Professor:* J.D. Fulton; *Visiting Assistant Professor:* N.L. Chenette; *Visiting Lecturers:* N. Hubing, A. Keaton, P.P. King

STAT 2220 Statistics in Everyday Life 3 (3) Focuses on the role of statistics in a variety of areas including politics, medicine, environmental issues, advertising, and sports. Students explore common statistical misconceptions and develop an understanding of how principles of probability and statistics affect many aspects of everyday life. Not open to students who have received credit for MATH 3020 or STAT 3090. *Prq:* Any MATH course or a score of 50 or higher on the Clemson Mathematics Placement Test.

STAT 2300 Statistical Methods I 3 (2) Basic concepts and methods of statistical inference; organization and presentation of data, elementary probability, measures of central tendency and variation, tests of significance, sampling, simple linear regression and correlation. Stresses the role of statistics in interpreting research and the general application of the methods. Statistical microcomputer software is used. Not open to students who have received credit for STAT 3090 or MATH 3020. Includes Honors sections. *Prq:* Any MATH course or STAT 2220 or a 65 or better on the Clemson Mathematics Placement Test. *Coreq:* STAT 2301.

STAT 2301 Statistical Methods I Laboratory 0 (2) Non-credit laboratory to accompany STAT 2300. *Coreq:* STAT 2300.

STAT 3090 Introductory Business Statistics 3 (3) Introductory probability and statistics for business students, particularly those who will take MGT 3100. Topics include descriptive statistics, probability, expectations, binomial, normal, sampling distributions, one and two sample estimation and testing. *Preq:* MATH 1060 or MATH 1070 or MATH 2070 or MATH 2100.

STAT 3300 Statistical Methods II 3 (3) Principle topics include collecting and summarizing data, probability distributions, analysis of categorical data, introduction to multiple linear regression, experimental design, analysis of variance, and non-parametric methods. Statistical computer software is used. Not open to students who have received credit for MATH 4020. *Preq:* MATH 3020 or STAT 2300.

STAT 4020* Introduction to Statistical Computing 3 (3) Introduction to statistical computing packages. Topics include data importation, basic descriptive statistic computation, basic graphic preparation, and statistical analysis methods and procedures. *Preq:* IE 3610 or MATH 3020 or MGT 3100 or STAT 2300.

STAT 4110* Statistical Methods for Process Development and Control 3 (3) Experimental design techniques for use in process development, application of screening experiments and response surface experiments, techniques for process control with implications for product quality control. Includes discussions of the use of statistical computer analyses and interpretations including computer-generated graphics. *Preq:* MATH 2060.

STAT 4620 Statistics Applied to Economics 3 (3) Continuation of EXST 3010 emphasizing statistical methods used in the collection, analysis, presentation, and interpretation of economic data. Special attention is given to time-series analysis, the construction of index numbers, and the designing of samples for surveys in the social science fields. *Preq:* STAT 2300.

SCIENCE AND TECHNOLOGY IN SOCIETY

STS 1010 Survey of Science and Technology in Society 3 (3) Surveys historical, philosophical, and social studies of science; introduces the basic requisites for scientific and technological literacy; and considers the problems of responsible participation in a scientifically and technologically advanced society.

STS 1020 Ideas, Machinery, and Society 3 (3) Interdisciplinary discussion course introducing the fundamental themes of STS: the influence of social groups on the development of science and technology and the effects of science and technology on society.

STS 1200 Topics in Science and Technology in Society 3 (3) Explores ethical, policy and social issues raised by the complex interactions among science, technology and society. Topics vary depending on the instructor.

STS 1710 Scientific Skepticism 3 (3) Investigation of unusual phenomena using scientific methodology. Explores the interplay of science, pseudoscience, and society through development of critical thinking skills. Discussion-oriented course that focuses on case studies of extraordinary claims.

STS 2150 A Critical Approach to the Global Challenge of Technological Revolutions 3 (3) This course takes a broad, humanistic perspective for understanding the challenges posed by scientific and technological revolutions, including innovations like nanotechnology, environmental preservation, bio-technology, digital technology, and nuclear fusion. Students learn skills and strategies for thinking critically about the nature of radical change in science and technology as it affects society.

STS 2160 Critical Analysis of a Current STS Issue 3 (3) Critical analysis of a current science and technology issue with significant controversial and societal consequences (e.g., global warming, methods of energy production). Students retrieve, analyze, evaluate, present and discuss relevant information to develop basic competence in science and mathematics and in the evaluation of scientific and technological issues. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Sophomore standing.

STS 3010 Science in Context 3 (3) Develops an understanding of the social character of scientific activity. Through the study of current work by leading historians, sociologists, and philosophers of science, students develop a comprehensive grasp of the social foundations of modern scientific inquiry.

STS 3030 Technology, Culture and Society 3 (3) Addresses issues that arise from the interaction of technology with its social and cultural context. To better understand how technologies relate to societies and cultures, students learn to use the analytic tools required to evaluate the significance of technology, as well as its relations to social endeavors and cultural endeavors.

STS 4980 Creative Inquiry 1-3 (1-3) Students conduct research into Science and Technology in Society with a team of their peers under the direction of a faculty member. The collaborative character of research in science and technology in society is emphasized. Includes Honors sections. May be repeated for a maximum of 12 credits.

STS 4990 Independent Study 1-3 (1-3) Study of selected topics under direction of a faculty member selected by the student. Student and faculty member develop a course of study designed for the individual student and approved by the STS program coordinator prior to registration. May be repeated for a maximum of six credits. Students are expected to have completed their General Education Science and Technology in Society Requirement before enrolling in this course. *Preq:* Consent of instructor.

THEATRE

Professor: D.J. Hartmann, *Chair; Associate Professors:* K.L. Johnson, A.M. Penna, S. Robert; *Assistant Professors:* K. Seymour, R. St. Peter; *Senior Lecturer:* C. Collins; *Lecturer:* J. Adkins

THEA 1950 Creative Inquiry—Theatre 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of instructor.

THEA 2100 Theatre Appreciation 3 (3) Examination of the theatre event approached through historical context, play reading, analysis of production practices, and field trips to live dramatic performances. Includes Honors sections.

THEA 2670 Stage Makeup Techniques 3 (2) Practical study of basic stage makeup techniques for the acting student including corrective makeup, modeling with paint, three-dimensional makeup, prosthesis with latex, and makeup for other media. *Coreq:* THEA 2671.

THEA 2671 Stage Makeup Techniques Laboratory 0 (1) Non-credit laboratory to accompany THEA 2670. *Coreq:* THEA 2670.

THEA 2770 Production Studies in Theatre 3 (3) Study of technical production and design including scenery, costume, and lighting through the examination of plays in production.

THEA 2780 Acting I 3 (2) Fundamentals of acting; basic stage techniques; exercises in interpretation, improvisation, characterization; experience in supervised scene study. *Coreq:* THEA 2781.

THEA 2781 Acting I Laboratory 0 (3) Non-credit laboratory to accompany THEA 2780. *Coreq:* THEA 2780.

THEA 2790 Theatre Practicum 1 (3) Practical work in theatre on a production designed for public presentation. May be repeated for a maximum of four credits.

THEA 2880 Introduction to Computer-Aided Drafting 3 (2) Introduction to the basics of computer-aided drafting. Software applications include AutoCAD, Vectorworks, and WYSWYG. *Coreq:* THEA 2881.

THEA 2881 Introduction to Computer-Aided Drafting Laboratory 0 (3) Non-credit laboratory to accompany THEA 2880. *Coreq:* THEA 2880.

THEA 2950 Creative Inquiry—Theatre 1-4 (1-4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. Creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of instructor.

THEA (MUSC) 3080 Survey of Broadway Musicals I 3 (3) Introduction to Broadway musical repertoire from the Golden Age of Broadway: 1943–1964. Emphasizes the music with attention to production detail, historical perspective, and social milieu. May also be offered as MUSC 3080.

THEA (MUSC) 3090 Survey of Broadway Musicals II 3 (3) Survey of Broadway musical repertoire from new conceptual shows from 1965 to the present day. Emphasizes the music with attention to production detail, historical perspective, and social milieu. May also be offered as MUSC 3090.

THEA 3150 Theatre History I 3 (3) Historical survey of Western and non-Western theatre. Emphasis is placed on the changing roles of the playwright, director, actor, technician, and spectator from antiquity to the Renaissance. *Preq:* Sophomore standing.

THEA 3160 Theatre History II 3 (3) Historical survey of Western theatre. Emphasis is placed on the changing roles of the playwright, director, actor, technician, and spectator from the Renaissance to the present. *Preq:* Sophomore standing.

- THEA 3170 African-American Theatre I 3 (3)** Acquaints students with the origin and development of African-American playwrights, plays, players, and their contributions to the American theatre from the 19th century to the Civil Rights Movement.
- THEA 3180 African-American Theatre II 3 (3)** Acquaints students with the development of African-American playwrights, plays, players, and their contributions to the American theatre from the Black Arts Movement to the present.
- THEA (MUSC) 3290 Musical Theatre Vocal Performance 3 (2)** Trains singer-actors in musical theatre repertoire. A study of repertoire via master classes, individual instruction, research of the historical context of Broadway music, studio performance, observation, and peer evaluation, culminating in a public showcase performance. May also be offered as MUSC 3290. *Coreq:* THEA 3291.
- THEA (MUSC) 3291 Musical Theatre Vocal Performance Laboratory 0 (2)** Non-credit laboratory to accompany THEA 3290. May also be offered as MUSC 3291. *Coreq:* THEA 3290.
- THEA (ENGL) 3470 The Structure of Drama 3 (3)** Introduction to the creative writing and critical study of drama. May also be offered as ENGL 3470.
- THEA 3500 Applied Theatre for Business and Industry I 3 (3)** Principles and practices from theatre to address social and educational issues in a wide range of settings, including teaching, justice, healthcare, political and community development; applying critical thinking and problem solving with theatre as a vehicle to develop plans for varying business approaches and models.
- THEA 3670 Costume Technology 3 (2)** Theory and practice of costume technology including equipment, patterning, fabric identification, cutting, construction, and fitting. *Coreq:* THEA 3671.
- THEA 3671 Costume Technology Laboratory 0 (3)** Non-credit laboratory to accompany THEA 3670. *Coreq:* THEA 3670.
- THEA 3680 Voice for the Stage 3 (2)** Study of the principles of vocal production and standard American speech for the stage; exercises in breath support and projection, improving tonal quality, and elimination of regional dialects through the study of the International Phonetic Alphabet. *Preq:* THEA 2780. *Coreq:* THEA 3681.
- THEA 3681 Voice for the Stage Laboratory 0 (3)** Non-credit laboratory to accompany THEA 3680. *Coreq:* THEA 3680.
- THEA 3720 Creative Drama 3 (3)** Practical applications using creative drama as a learning tool to strengthen group collaboration and creative goals. Students develop strategies for workshop designs in varying settings with focus toward exploration, discovery and broadened perspectives toward group and individual creative practice.
- THEA 3740 Stage Movement for Actors 3 (1)** Study of the psychological and physical sources of movement in the human body, with emphasis on the attainment of intellectual and physical control and the application of the skills to the development of a role. *Preq:* THEA 2780. *Coreq:* THEA 3741.
- THEA 3741 Stage Movement for Actors Laboratory 0 (1)** Non-credit laboratory to accompany THEA 3740. *Coreq:* THEA 3740.
- THEA 3760 Stage Directing I 3 (2)** Directing and staging techniques for the proscenium stage; exercises in composition, movement, picturization; experience in direction of scenes. *Preq:* Sophomore standing and either THEA 2770 or THEA 2780. *Coreq:* THEA 3761.
- THEA 3761 Stage Directing I Laboratory 0 (3)** Non-credit laboratory to accompany THEA 3760. *Coreq:* THEA 3760.
- THEA 3770 Stagecraft 3 (2)** Theory and practice of stage design and technology. *Preq:* Sophomore standing. *Coreq:* THEA 3771.
- THEA 3771 Stagecraft Laboratory 0 (3)** Non-credit laboratory to accompany THEA 3770. *Coreq:* THEA 3770.
- THEA 3790 Acting Ensemble 1 (3)** Performance opportunities in the area of theatre for young audiences. Students are members of a theatrical touring troupe and perform in a variety of spaces and locations. May be repeated for a maximum of four credits. *Preq:* Consent of instructor by way of audition only.
- THEA 3880 Stage Management 3 (3)** Examines the vital part stage managers play in every theatrical production including organizing rehearsals, facilitating communication between director and designers, and calling cues during performances. Introduces the art and craft of stage management by incorporating Performing Arts Department and Brooks Center productions.
- THEA 3950 Creative Inquiry—Theatre 1-4 (1-4)** In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of instructor.
- THEA 3980 Special Topics in Theatre 3 (3)** Select areas of study in theatre not addressed by other theatre course offerings. May be repeated once. *Preq:* Consent of instructor.
- THEA (ENGL) 4290* Dramatic Literature I 3 (3)** Selected reading in the dramatic literature from the classical era of Greece and Rome to the Renaissance. May also be offered as ENGL 4290. *Preq:* ENGL 3100.
- THEA (ENGL) 4300* Dramatic Literature II 3 (3)** Principles and progress of drama from the Restoration to the present; analysis of representative plays; critical reports; discussion of trends in dramatic literature. May also be offered as ENGL 4300. *Preq:* ENGL 3100.
- THEA (ENGL) 4470* Playwriting Workshop 3 (3)** Workshop in the creative writing of plays. May be repeated once. May also be offered as ENGL 4470. *Preq:* ENGL 3470 or THEA 3470.
- THEA 4500 Applied Theatre for Business and Industry II 3 (3)** Advanced projects to address social and educational issues using theatre as a vehicle to develop portfolio material and specialized business approaches relative to individual fields of study. *Preq:* THEA 3500.
- THEA 4670 Costume Design 3 (3)** Theory and practice of costume design for the theatre including the study of production concept and styles, sketching, and rendering.
- THEA 4720* Improvisation 3 (3)** Practical applications using drama to motivate collaboration, heighten analytical skills, and strengthen group thinking and processing skills. Explorations include workshop design and leadership among various venues and participant groups, honing strengths toward positive and creative problem-solving. Techniques include strategies for writers, actors, directors, visual artists, teachers, and workshop leaders.
- THEA 4760 Stage Directing II 3 (2)** Continued study in the art of stage directing emphasizing historical and contemporary theory and methodology with a focus on special topics. *Preq:* THEA 3760. *Coreq:* THEA 4761.
- THEA 4761 Stage Directing II Laboratory 0 (3)** Non-credit laboratory to accompany THEA 4760. *Coreq:* THEA 4760.
- THEA 4770 Stage Design 3 (2)** Study and practice in stage design, including drafting, graphics, drawing, rendering, scene painting, and light plotting. *Preq:* THEA 3770. *Coreq:* THEA 4771.
- THEA 4771 Stage Design Laboratory 0 (3)** Non-credit laboratory to accompany THEA 4770. *Coreq:* THEA 4770.
- THEA 4790 Acting II 3 (2)** Continued study in the craft of acting for contemporary Western theatre. Students focus on monologue and scene study in a variety of performance settings. *Preq:* THEA 2780. *Coreq:* THEA 4791.
- THEA 4791 Acting II Laboratory 0 (3)** Non-credit laboratory to accompany THEA 4790. *Coreq:* THEA 4790.
- THEA 4800 Advanced Scene Study for Actors 3 (2)** Students interpret and perform in complex plays written in heightened styles and integrating period movement into the various genres and styles of plays throughout major periods of theatre history. Styles include Elizabethan, Comedy of Manners, and early Realism. *Preq:* THEA 4790. *Coreq:* THEA 4801.
- THEA 4801 Advanced Scene Study for Actors Laboratory 0 (3)** Non-credit laboratory to accompany THEA 4800. *Coreq:* THEA 4800.
- THEA 4870* Stage Lighting I 3 (2)** Theory and practice of stage lighting through an understanding of various lighting instruments, lighting control systems, and execution of lighting designs. *Coreq:* THEA 4871.
- THEA 4871* Stage Lighting I Laboratory 0 (1)** Non-credit laboratory to accompany THEA 4870. *Coreq:* THEA 4870.
- THEA 4880 Stage Lighting II 3 (2)** Study of advanced stage lighting theories and practices including script analysis, technology, software and execution of lighting designs. Other topics include unions and contracts, shop orders, and assisting the lighting designer. *Preq:* THEA 4870. *Coreq:* THEA 4881.
- THEA 4881 Stage Lighting II Laboratory 0 (3)** Non-credit laboratory to accompany THEA 4880. *Coreq:* THEA 4880.

THEA 4950 Creative Inquiry—Theatre 1-4 (1-4)

In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. *Preq:* Consent of instructor.

THEA 4970* Scene Painting 3 (2) Practical study of basic painting techniques for the theatre including layout, proper use of materials, painting styles, and texturing techniques. *Coreq:* THEA 4971.

THEA 4971* Scene Painting Laboratory 0 (1) Non-credit laboratory to accompany THEA 4970. *Coreq:* THEA 4970.

THEA 4990 Independent Studies 1-3 (1-3) Tutorial work for students with special interests outside the scope of existing courses. May be repeated for a maximum of six credits. *Preq:* Consent of instructor.

WORLD CINEMA

WCIN 4550 History of Non-Western Cinemas 3 (2) Close study of the development of a specific national or regional non-Western cinema (e.g., Japanese, Indian, Chinese, African, Middle Eastern) in terms of its aesthetic, theoretical and sociopolitical dimensions. Cinematographic and storytelling techniques in Western and non-Western filmmaking forms are compared. *Preq:* ENGL 3570. *Coreq:* WCIN 4551.

WCIN 4551 History of Non-Western Cinemas Laboratory 0 (3) Non-credit laboratory to accompany WCIN 4550. *Coreq:* WCIN 4550.

WCIN 4570 Global Hollywood 3 (2) Explores the ways Hollywood film industry participates in global and international networks of production, distribution and exhibition. Critical examination of Hollywood's impact on other cinematic traditions. *Preq:* ENGL 3570. *Coreq:* WCIN 4571.

WCIN 4571 Global Hollywood Laboratory 0 (3) Non-credit laboratory to accompany WCIN 4570. *Coreq:* WCIN 4570.

WCIN 4580 Adaptations of World Classics 3 (2) Study of selected film and/or other media adaptations of classics in world literature, with attention to adaptation theory, language, form, history and culture. Topics vary. *Preq:* ENGL 3570. *Coreq:* WCIN 4581.

WCIN 4581 Adaptations of World Classics Laboratory 0 (3) Non-credit laboratory to accompany WCIN 4580. *Coreq:* WCIN 4580.

WCIN 4620 World Documentary 3 (2) Introduces students to the history, theory and form of documentary practice in international context. Through a selection of representative works, students examine the ethical, legal, aesthetic and social concerns inherent in the genre. *Preq:* ENGL 3570. *Coreq:* WCIN 4621.

WCIN 4621 World Documentary Laboratory 0 (3) Non-credit laboratory to accompany WCIN 4620. *Coreq:* WCIN 4620.

WCIN 4760 Filmmaking for Mobile Media 3 (2)

Students apply their knowledge of film theory and techniques through low-to-no-budget digital videos for dissemination on mobile media devices such as smartphones and tablet computers. Students will learn to operate low-budget video equipment and edit video on professional editing software in a hands-on workshop. *Preq:* DPA 3070 or ENGL 3570. *Coreq:* WCIN 4761.

WCIN 4761 Filmmaking for Mobile Media Laboratory 0 (3) Non-credit laboratory to accompany WCIN 4760. *Coreq:* WCIN 4760.

WCIN 4960 Capstone Seminar 3 (2) In-depth exploration and analysis of a special topic in World Cinema, culminating in a capstone project documented in written, oral, visual and multimedia presentation. Students apply their expertise to produce research of publishable quality and scope. Senior standing in World Cinema major. *Coreq:* WCIN 4961.

WCIN 4961 Capstone Seminar Laboratory 0 (3) Non-credit laboratory to accompany WCIN 4960. *Coreq:* WCIN 4960.

WCIN 4990 World Cinema Practicum 3-6 (3-6) Students apply their practical and theoretical knowledge to a substantive project involving their internship experience and/or creative option. Course provides elements of pre-professional training. *Preq:* Junior standing in the World Cinema major.

WILDLIFE AND FISHERIES BIOLOGY

Professors: W.H. Conner, J.D. Lanham, P.A. Layton, G.K. Yarrow, *Chair;* *Associate Professors:* R.F. Baldwin, P.G. Jodice, A.R. Johnson, E. Mikhailova; *Assistant Professors:* D. Jachowski, Y. Kanno; *Lecturers:* J.R. Davis, D. Hagen, S. Rodriguez

WFB 3000 Wildlife Biology 3 (3) Natural history, biology, and conservation of wildlife managed by natural resource agencies. Attention is given to those factors important in the management and conservation including species distribution and abundance, habitat requirements, and life-history characteristics. Principles and problems associated with conservation of selected wildlife species are covered. *Preq:* One of the following combinations: BIOL 1030 and BIOL 1050 and BIOL 1040 and BIOL 1060; OR BIOL 1100 and BIOL 1110.

WFB 3010 Wildlife Biology Laboratory 1 (3) Identification of wildlife species with emphasis on game and non-game wildlife species managed or protected by state and federal agencies. One or more required weekend field trips will be scheduled. *Preq:* Wildlife and Fisheries Biology field of study. *Preq or concurrent enrollment:* WFB 3000.

WFB 3070 Hunting and Wildlife Management 1 (1) Hunting techniques used to harvest renewable wildlife resources are examined with respect to their roles in sound management practices. The effects of selected hunting regulations on wild populations, safety, and ethics are discussed. *Preq:* Junior standing.

WFB (BIOL) 3130 Conservation Biology 3 (3)

Study of the biological bases for the conservation of flora, fauna, and habitats. Biological factors that influence the decision-making process are also addressed. May also be offered as BIOL 3130. *Preq:* BIOL 1030 and BIOL 1050 and BIOL 1040 and BIOL 1060; or BIOL 1100 and BIOL 1110.

WFB 3500 Principles of Fish and Wildlife Biology 3 (3) Introduction to principles of fisheries and wildlife biology on which sound management practices are based. Interrelationships of vertebrate and invertebrate biology, habitat, and population dynamics are covered. *Preq:* One of the following combinations: BIOL 1030 and BIOL 1050 and BIOL 1040 and BIOL 1060; OR BIOL 1100 and BIOL 1110.

WFB 4100* Wildlife Management Techniques 3 (1) Covers field and laboratory methods commonly used in wildlife management and research. Students interact with wildlife professionals. Topics include research methodology, estimating wildlife population characteristics, condition measures, and food habits; species determination, sex, and age; capture; population monitoring methods; GIS and mapping techniques, habitat evaluation and improvement. *Preq:* WFB 3000 and WFB 3500. *Coreq:* WFB 4101.

WFB 4101* Wildlife Management Techniques Laboratory 0 (6) Non-credit laboratory to accompany WFB 4100. *Coreq:* WFB 4100.

WFB 4120* Wildlife Management 3 (2) Basic principles and general practices of wildlife management and conservation are covered. Major problems concerning the management of wildlife resources, with emphasis on upland game species. Laboratory work includes practical work on the Clemson University woodlands and field trips to several areas where wildlife management is being practiced. Includes Honors sections. *Preq:* WFB 3000 and WFB 3500. *Coreq:* WFB 4121.

WFB 4121* Wildlife Management Laboratory 0 (3) Non-credit laboratory to accompany WFB 4120. *Coreq:* WFB 4120.

WFB 4140* Wildlife Nutritional Ecology 3 (3) Concepts of how terrestrial wildlife obtains and utilizes energy and nutrients in wild ecosystems are taught. Energy and nutrient availability are discussed in the ecological context of distribution, flow, and cycling in natural and modified foraging areas. Physiology of digestion is discussed for major homeotherms. *Preq:* WFB 3000 and WFB 3500.

WFB 4150* Quality Deer Management 3 (3) Quality Deer Management (QDM) is a stewardship philosophy that provides desirable hunting experiences by producing white-tailed deer herds with a natural age and sex structure and population size appropriate for habitat conditions. The course will emphasize herd management, habitat management, hunter management and herd monitoring. Online course. *Preq:* Junior standing.

WFB 4160* Fishery Biology 3 (2) Principles underlying freshwater fish production. Introduction to major groups of freshwater fishes and their habitats. Topics include identification, age and growth, fecundity, food habits, populations estimation, environmental evaluation, management practices, and fish culture. *Preq:* WFB 3000 and WFB 3500. *Coreq:* WFB 4161.

- WFB 4161* Fishery Biology Laboratory 0 (3)** Non-credit laboratory to accompany WFB 4160. *Coreq:* WFB 4160.
- WFB 4180 Fishery Conservation 3 (3)** Survey of conservation efforts directed toward freshwater and marine fisheries resources. Topics include threatened, endangered, and over-exploited species and introductions of exotic species. *Preq:* WFB 3000 and WFB 3500.
- WFB 4300* Wildlife Conservation Policy 3 (3)** Deals with the ecological rationale and management implications of public policy designed for the conservation of American wildlife resources. Emphasis is on managed-land issues. *Preq:* WFB 3000 and WFB 3500.
- WFB 4400 Non-Game Wildlife Management 3 (3)** Basic principles and general practices of non-game wildlife management are covered. Emphasis is placed on those principles and practices most appropriately used by state agencies in their management programs for non-game species, along with real-world problems associated with implementation of such programs. *Preq:* WFB 3000 and WFB 3500.
- WFB 4440* Wildlife Damage Management 3 (2)** Covers the philosophical, sociological, ecological, and economical basis for controlling damage caused by animals problem wildlife populations. Emphasis is placed on fundamentals of prevention and control of damage caused by vertebrate species, especially mammals and birds. Includes interaction with federal and state agencies and private consultants. *Preq:* WFB 3000 and WFB 3500. *Coreq:* WFB 4441.
- WFB 4441* Wildlife Damage Management Laboratory 0 (3)** Non-credit laboratory to accompany WFB 4440. *Coreq:* WFB 4440.
- WFB 4450 Urban Wildlife Management 3 (3)** Focuses primarily on social, scientific, and ecological aspects of managing wildlife in the urban setting. Basic wildlife management techniques as well as urban planning for wildlife are covered. *Preq:* WFB 3000 and WFB 3500.
- WFB 4500* Aquaculture 3 (3)** Basic aqua-cultural techniques applied to freshwater and marine organisms; past and present culture of finfishes and shellfishes around the world; principles underlying fish production; water quality, feeding, and nutrition as they influence production of cultured aquatic organisms. *Preq:* WFB 3000 and WFB 3500.
- WFB 4600* Warmwater Fish Diseases 2 (2)** Study of diseases in warmwater fish including infectious and noninfectious processes. *Preq:* WFB 3000 and WFB 3500.
- WFB 4620* Wetland Wildlife Biology 3 (3)** Study of wetland wildlife habitats, emphasizing classification by physical, chemical, and biological characteristics; importance of wetland habitat for management and production of wetland wildlife species. Offered fall semester only. Includes Honors sections. *Preq:* WFB 3000 and WFB 3500.
- WFB 4630 Directed Research in Aquaculture, Fisheries, and Wildlife Biology 1 (3)** Research problems in selected areas of aquacultural, fisheries, or wildlife science to introduce students to experimental design, research techniques, and presentation of research results. May be repeated for a maximum of three credits. *Preq:* Junior standing and consent of instructor.
- WFB (BIOL) 4680* Herpetology 4 (3)** Physiology, functional morphology, ecology, evolution, biomechanics and current literature of amphibians and reptiles. Laboratory study examines morphology and identification of world families and United States genera, as well as southeastern species. Field trips are required. May also be offered as BIOL 4680. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110. *Coreq:* WFB 4681.
- WFB (BIOL) 4681* Herpetology Laboratory 0 (3)** Non-credit laboratory to accompany WFB 4680. May also be offered as BIOL 4681. *Coreq:* WFB 4680.
- WFB (BIOL, ENT) 4690* Aquatic Insects 3 (1)** Identification, life history, habitats, and interrelationships of aquatic insects; techniques of qualitative field collecting; important literature and research workers. Includes Honors sections. May also be offered as BIOL 4690 and ENT 4690. *Preq:* ENT 3010. *Coreq:* WFB 4691.
- WFB (BIOL, ENT) 4691* Aquatic Insects Laboratory 0 (6)** Non-credit laboratory to accompany WFB 4690. May also be offered as BIOL 4691 or ENT 4691. *Coreq:* WFB 4690.
- WFB (AGRB) 4750 Economics of Wildlife Management and Policy 3 (3)** Integrated approach to the study of the economics of wildlife. Topics include determination of market and nonmarket value, single and multiple species management, enterprise cost and returns, marketing wildlife, leasing methods, complementarity and competitiveness with agricultural and forestry enterprises, and timber and crop damage cost estimates and control. May also be offered as AGRB 4750. *Preq:* AGRB 2020 or ECON 2000 or ECON 2110 or FOR 3040 or WFB 3060.
- WFB 4760* Bird Conservation and Ecology 3 (1)** Field-intensive introduction to the identification, ecology, and conservation of North American birds and their habitats with an emphasis on management and applied field ornithology. Includes bird/habitat survey and census techniques. At least one weekend (Friday-Sunday) field trip is required. *Preq:* BIOL 1040 and BIOL 1060; or BIOL 1110. *Coreq:* WFB 4761.
- WFB 4761* Bird Conservation and Ecology Laboratory 0 (4)** Non-credit laboratory to accompany WFB 4760. *Coreq:* WFB 4760.
- WFB 4930 Selected Topics 1-4 (1-4)** Specialized topics which explore current areas of research and management in aquaculture, fisheries science, or wildlife management are examined in lecture/seminar format. May be repeated for a maximum of ten credits, but only if different topics are covered. *Preq:* Junior standing and consent of instructor. *Coreq:* WFB 4931.
- WFB 4931 Selected Topics Laboratory 0 (1-4)** Non-credit laboratory to accompany WFB 4930. *Coreq:* WFB 4930.
- WFB 4980 Senior Portfolio 1 (1)** Collection of Web-based materials representing the creative and scientific papers, presentations, and résumés written by students to satisfy curriculum requirements. Students are regularly informed regarding the format and content of their portfolios. *Preq:* Senior standing and Wildlife and Fisheries Biology field of study. *Preq or concurrent enrollment:* FNR 4990.

WOMEN'S STUDIES

Professor: J.M. Melton; *Associate Professor:* E.K. Sparks; *Assistant Professor:* M. Shockley; *Lecturer:* S. Watts

WS 1030 Women in Global Perspective 3 (3) Cross-cultural and multidisciplinary introduction to issues facing women globally. Issues may include women and work, violence against women, reproduction and women's health, sexuality and rites of passage, women and the weight of tradition, movements for women's empowerment.

WS 2300 Women and Leadership 3 (3) Students learn the basics of leadership, including an understanding of different leadership styles, effective leadership practices, and the unique challenges and opportunities faced by women leaders. Attention is paid to the ways in which female leaders are both the same as and different from their male counterparts, and to the ways in which female leaders can affect positive change in women's lives. Ethical leadership, leadership in a diverse global environment, and different paths to leadership are also explored.

WS 3010 Introduction to Women's Studies: Women's Lives 3 (3) Interdisciplinary course exploring the unique features of women's lives from childhood to old age. Content is based on new research in many disciplines, including psychology, sociology, history, literature, and the arts. *Preq:* Sophomore standing.

WS (COMM) 3160 Girlhood, Media, and Popular Culture 3 (3) Explores how the mass media and popular culture contribute to social constructions of girlhood. Employing the critical lens of feminist and communication theories, students examine mediated depictions of girls as well as how girls actively produce and negotiate media and popular culture. May also be offered as COMM 3160. *Preq:* COMM 2010 with a C or better or WS 3010.

WS (PHIL) 3490 Theories of Gender and Sexuality 3 (3) Examines the philosophical dimensions of contemporary debates about the relation of sex, gender, and sexuality. May also be offered as PHIL 3490.

WS 3900 Womens Studies Internship 3 (8) Faculty-supervised internship provides Women's Studies minors with relevant work experience, mentoring, and networking opportunities with local leaders in business, government, and non-profit organizations. *Preq:* Women's Studies minor, Junior standing, and consent of internship coordinator.

WS 4010 Senior Seminar 3 (3) In-depth exploration and analysis of a special topic in the areas of women's and leadership studies, culminating in a senior project documented in written, oral, visual and/or multimedia presentations. Topics vary based on student research interests. *Preq:* Senior standing in Women's Leadership.

WS (ANTH) 4230* Women in the Developing World 3 (3) Comparative anthropological study of women and their status in developing countries around the world. A survey of women's daily lives in a global context, emphasizing education, economics, and the environment. Case studies include microfinance, literacy, reproductive rights and practices, and the impact of religious fundamentalism on women. May also be offered as ANTH 4230. *Preq:* Sophomore standing.

WS (ENGL) 4360* Feminist Literary Criticism 3 (3) Introduces the germinal works of feminist literary theory and criticism. Outlines the development of modern literary criticism by studying feminist versions of the major critical methodologies. May also be offered as ENGL 4360. *Preq:* ENGL 3100.

WS 4590 Selected Topics in Women's Studies 1-3 (1-3) Topics change from semester to semester and are announced prior to registration. May be repeated for a maximum of six credits, but only if different topics are covered.

WS 4900 Creative Inquiry 1-3 (1-3) Small group work on particular issues with emphasis on involving students in research. Content varies. May be repeated for a maximum of six credits. *Preq:* Consent of instructor.

WS 4950 Independent Study 1-3 (1-3) Course of study designed by the student in consultation with a faculty member who agrees to provide guidance, discussion, and evaluation of the project. Student must confer with faculty member prior to registration. May be repeated for a maximum of six credits. *Preq:* Consent of instructor.

YOUTH DEVELOPMENT PROGRAM

YDP 3000 Youth Development in Society 3 (3) The course provides an overview of youth development in society. It examines social change and its impact on youth development, the historical development of youth programs, programs and plans designed to be responsive to youth issues, and supports to assist youth in becoming healthy, productive, and engaged citizens. *Preq:* Youth Development Studies major.

YDP 3050 Theory and Philosophy of Youth Development Work 3 (3) This course examines the philosophical, conceptual, and theoretical frameworks of positive youth development from the perspective of real-world application within developmental systems. Students explore both the distinctiveness and complementarity between problem-focused and youth development approaches to youth work, and work on building a common language for the field. *Preq:* Youth Development Studies major.

YDP 3100 Youth Development and the Family 3 (3) This course focuses on youth in the context of family development and interpersonal family dynamics. Students gain knowledge and skills to strengthen families and foster youth well being. Students also gain the skills to develop effective programs involving the family unit and the ability to conceptualize youth development from a systemic perspective. *Preq:* Youth Development Studies major.

YDP 3150 Community and Youth Development Systems 3 (3) This course focuses on organizations and systems that offer opportunities for youth to reach their potential and develop competencies and assets. These approaches include studying educational systems that foster success, community organizations that engage youth in becoming leaders and contributing members, and environments that are conducive to youth well being. *Preq:* Youth Development Studies major.

YDP 3200 Youth Development in Sport and Physical Activities 3 (3) This course examines the role of community-based sports in developing healthy youth, specifically the ways in which sport programs can be designed to maximize physical, intellectual, emotional, and social outcomes. Focus is on the role of key adults and institutions in the delivery of youth sport experiences. *Preq:* Youth Development Studies major.

YDP 3250 Working with Diverse Youth 3 (3) This course focuses on diversity in youth-oriented programs and settings, and provides an understanding of how race, ethnicity, gender, religion, disability, and social class affect youth development work. An emphasis is placed on building a working knowledge of cultural awareness and sensitivity as applied to the design of youth activities. *Preq:* Youth Development Studies major.

YDP 3300 Designing Effective Youth Programs 3 (3) This course introduces students to a variety of approaches to youth development programming. The main focus is on intentional or purposeful program planning designed to achieve targeted youth outcomes. As a class, students design a youth development program that is delivered as a component of YDP 3400. *Preq:* Youth Development Studies major.

YDP 3350 Youth Activity Facilitation and Leadership 3 (3) This course provides a foundation for effective activity leadership to meet the needs of diverse youth populations. The course focuses on applying experiential learning approaches; different activity types; choosing activities based on intentionality, specificity, and applicability; activity sequencing; building individual and group efficacy; and activity debriefing and processing. *Preq:* Youth Development Studies major.

YDP 3400 Delivering Effective Youth Programs 3 (3) This course provides students with the knowledge and tools to deliver and present effective and intentional youth development programs. The course builds on the content of YDP 3300, and focuses on key programming issues, such as animation plans, equipment and facilities, program flexibility, risk management, and formative and summative assessment. *Preq:* Youth Development Studies major.

YDP 3450 Creative Activities for Youth 3 (3) This course examines the use of various creative activities in youth programs. Students explore the cognitive strengths of various creative activities, how to integrate creativity into youth programs, the importance of creative activities in community identity, and the availability of community resources. *Preq:* Youth Development Studies major.

YDP 4400 Youth Program Assessment and Evaluation 3 (3) Youth development has generated best practice programs as a consequence of evidence-based assessment and evaluation. This course familiarizes students with current best practice programs. Evaluation design concepts and strategies provide a knowledge base that prepares students with the skills to employ in evaluations of youth development programs. *Preq:* Youth Development Studies major.

YDP 4450 Administration of Youth Development Organizations 3 (3) This course examines approaches and strategies for the successful administration of youth organizations. Students explore organizational missions, structures, personnel management, legal issues, promotion, financial management, assessment, and strategic planning within the context of public, not-for-profit, and private youth-serving agencies and organizations. *Preq:* Youth Development Studies major.

YDP 4500 Professional Issues and Ethics in Youth Development 3 (3) This course provides an intensive study and culminating discussion of contemporary problems, techniques, and ethical issues in youth development. In addition, students are introduced to the process of developing original research questions in the youth development field. *Preq:* Youth Development Studies major.

YDP 4550 Youth and Technology 3 (3) This course examines the uses of technology by youth. Students explore the current uses of technology by different types of youth, the ethical issues related to youth and technology, and socio-cultural changes resulting from the use of technology by youth. *Preq:* Youth Development Studies major.

YDP 4990 Youth Development Fieldwork 3 (2) This course provides practical experience linking students to new hands-on learning opportunities in youth serving agencies/organizations. Students are required to complete a minimum of 60 hours of experiential learning in a supervised youth services setting. Students develop a professional portfolio and special project as part of this experience. *Preq:* Youth Development Studies major.

YDP 4991 Youth Development Fieldwork Laboratory 0 (4) Non-credit laboratory to accompany YDP 4990. *Coreq:* YDP 4990.

FACULTY

- Abercrombie, John G.**, *Senior Lecturer, Biological Sciences*. BS, Furman University, 1995; MS, Clemson University, 2001
- Abernathy, James H., III**, *Adjunct Associate Professor, Industrial Engineering*. BS, University of the South, 1995; MPH, 1996, MD, 2001, University of Alabama-Birmingham
- Abou-Samra, Sulafa**, *Lecturer, Languages*. BA, University of Damascus (Syrian Arab Republic), 1997; MA, University of Texas, 2002
- Abu-Farha, Fadi K.**, *Assistant Professor, Automotive Engineering*. BSc, University of Jordan (Jordan), 2001; PhD, University of Kentucky, 2007
- Ackroyd, Patricia C.**, *Adjunct Assistant Professor, Chemistry*. BS, Brigham Young University, 1993; PhD, University of Michigan, 2001
- Adams, Warren P.**, *Professor, Mathematical Sciences*. BS, Lewis University, 1979; MS, 1981, PhD, 1984, Virginia Tech
- Adelberg, Jeffrey W.**, *Professor, Agricultural & Environmental Sciences*. BS, 1982, MS, 1987, Rutgers University; PhD, Clemson University, 1993
- Adler, Peter H.**, *Professor, Agricultural & Environmental Sciences*. BS, Washington and Lee University, 1976; MS, 1979, PhD, 1983, Pennsylvania State University
- Agudelo, Paula**, *Associate Professor, Agricultural & Environmental Sciences*. BS, National University of Colombia (Colombia), 1996; MSc, University of Caldas (Colombia), 2000; PhD, University of Arkansas, 2004
- Ajello, Marco**, *Assistant Professor, Physics & Astronomy*. BSc, 2001, MS, 2001, University of Palermo (Italy); MS, University of Trieste (Italy), 2003; PhD, Technical University Munich (Germany), 2007
- Albright, Dustin G.**, *Assistant Professor, School of Architecture*. BS, Washington and Lee University, 2003; MS, 2006, MArch, 2008, Virginia Tech
- Alekseeva, Sofya**, *Visiting Lecturer, Mathematical Sciences*. BS, Novosibirsk State University (Russia), 1989; PhD, Institute of Machines Science of the Russian Academy of Sciences (Russia), 2003
- Alexander, John C., Jr.**, *Breazeale Professor of Financial Planning, School of Accountancy & Finance*. BBA, 1984, MBA, 1985, Stetson University; PhD, Florida State University, 1991
- Alexis, Frank**, *Assistant Professor, Bioengineering*. BSc, 1999, MSc, 2000, University of Montpellier II (France); PhD, Nanyang Technological University (Singapore), 2006
- Alexov, Emil G.**, *Professor, Physics & Astronomy*. MS, 1984, PhD, 1990, Sofia University (Bulgaria)
- Allard, Cora M.**, *Lecturer, Biological Sciences*. BS, Millikin University, 2000; MS, University of Kentucky, 2003
- Allen, Jeffery S.**, *Adjunct Assistant Professor, Forestry & Environmental Conservation*. BS, Michigan State University, 1983; MS, University of South Carolina, 1986; PhD, Clemson University, 2005
- Allen, Lawrence R.**, *Professor, Parks, Recreation & Tourism Management*. BS, West Chester State University, 1970; MS, 1974, PhD, 1979, University of Maryland
- Alley, Pamela R.**, *Senior Lecturer, Psychology*. BA, 1975, MA, 1978, PhD, 1983, University of Connecticut
- Alley, Thomas R.**, *Professor, Psychology*. BA, 1975, BS, 1975, Pennsylvania State University; MA, 1979, PhD, 1981, University of Connecticut
- Allison, David J.**, *Alumni Professor, School of Architecture*. BS, 1978, MArch, 1982, Clemson University; FAIA
- Allred, Sherri T.**, *Lecturer, English*. BA, University of North Carolina-Charlotte, 1991; MA, Clemson University, 2007
- Altstatt, Hamilton S.**, *Professor Of Practice, Performing Arts*. BS, Drexel University, 1983
- Alyanak, Edward J.**, *Adjunct Assistant Professor, Mechanical Engineering*. BS, Purdue University, 2002; PhD, Wright State University, 2006
- Amerson, Roxanne**, *Assistant Professor, School of Nursing*. BS, Regents College, 1995; MSN, Clarkson College, 1999; PhD, Clemson University, 2009
- An, Yanming**, *Professor, Languages*. BA, 1982, MA, 1985, Fudan University (China); PhD, University of Michigan, 1997
- An, Yuehwei**, *Adjunct Associate Professor, Bioengineering*. MD, Harbin Medical University (China), 1983; MM, Beijing Medical University (China), 1986
- Andersen, Charles B.**, *Adjunct Professor, Environmental Engineering & Earth Sciences*. BS, Texas A&M University, 1984; MS, Miami University, 1988; PhD, Syracuse University, 1994
- Anderson, David P.**, *Adjunct Professor, Chemical & Biomolecular Engineering*. BA, Clemson University, 1973; MS, 1977, PhD, 1981, University of Massachusetts
- Anderson, Daniel**, *Director, Leisures Skills; Lecturer, Parks, Recreation & Tourism Management*. BS, 1997, Western Illinois University; MS, 2009, Clemson University
- Anderson, Denise M.**, *Associate Professor, Parks, Recreation & Tourism Management*. BA, Illinois Wesleyan University, 1992; MS, Eastern Illinois University, 1993; PhD, University of Illinois, 2000
- Anderson, Henry K.**, *Lecturer, School of Accountancy & Finance*. BA, Furman University, 1979; MPAcc, Clemson University, 1984; CPA (Georgia and South Carolina), CMA
- Anderson, Paul C.**, *Associate Professor, History*. BA, University of North Carolina, 1990; MA, 1994, PhD, 1998, University of Mississippi
- Andrae, John G.**, *Associate Professor, Agricultural & Environmental Sciences*. BS, Texas A&M University, 1993; MS, Oklahoma State University, 1995; PhD, University of Idaho, 2000
- Andres, Brad A.**, *Adjunct Associate Professor, Forestry & Environmental Conservation*. BS, Pennsylvania State University, 1982; MS, 1989, PhD, 1996, Ohio State University
- Andrew, John R., Jr.**, *Professor, History*. BA, University of North Carolina, 1987; MA, Clemson University, 1993; PhD, University of Georgia, 1997
- Andrus, Ronald D.**, *Professor, Civil Engineering*. BS, 1983, MS, 1986, Brigham Young University; PhD, University of Texas, 1994
- Anido, Raquel**, *Assistant Professor, Languages*. Licenciatura en Derecho, University of Barcelona (Spain), 2003; PhD, Johns Hopkins University, 2010
- Anker, Jeffrey N.**, *Associate Professor, Chemistry*. BS, Yale University, 1998; PhD, University of Michigan, 2005
- Apon, Amy W.**, *Division Chair and Professor of Computer Science, School of Computing, School of Computing*. BS, 1979, MA, 1981, MS, 1983, University of Missouri-Columbia; PhD, Vanderbilt University, 1994
- Appling, Jeffrey R.**, *Associate Dean for Curriculum, Office of Undergraduate Studies; Associate Professor, Chemistry*. BS, 1980, PhD, 1985, Georgia Institute of Technology
- Arab, Ali**, *Adjunct Assistant Professor, Agricultural & Environmental Sciences*. BS, Iran University of Science and Technology (Iran), 1999; MS, Southern Illinois University-Edwardsville, 2002; PhD, University of Missouri-Columbia, 2007
- Arai, Yuji**, *Adjunct Associate Professor, Agricultural & Environmental Sciences*. BS, University of California-Davis, 1996; PhD, University of Delaware, 2002
- Argraves, William S.**, *Adjunct Professor, Bioengineering*. BS, 1978, PhD, 1985, University of Connecticut
- Armstrong, James B.**, *Adjunct Professor, Forestry & Environmental Conservation*. BS, Freed-Hardeman College, 1976; MS, Abilene Christian University, 1978; PhD, Virginia Tech, 1989
- Arthur-Banning, Skye G.**, *Associate Professor, Parks, Recreation & Tourism Management*. BS, Brock University (Canada), 1997; MS, Oregon State University, 1999; PhD, University of Utah, 2005
- Arya, Dev P.**, *Professor, Chemistry*. BS, University of Delhi (India), 1996; PhD, Northeastern University, 1996
- Ash, Erin M.**, *Assistant Professor, Communication Studies*. BA, College of Charleston, 2008; MA, 2010, PhD, 2013, Pennsylvania State University
- Ashley-Ross, Miriam A.**, *Adjunct Associate Professor, Biological Sciences*. BS, Northern Arizona University, 1988; PhD, University of California-Irvine, 1994
- Ashton, Susanna M.**, *Professor, English*. BA, Vassar College, 1989; MA, 1993, PhD, 1998, University of Iowa
- Askew, George R.**, *Dean, College of Agriculture, Forestry & Life Science; Vice President for Public Service*. BS, 1976, MS, 1978, PhD, 1981, Clemson University
- Atamturktur, Huriye S.**, *Associate Professor, Civil Engineering*. BS, Middle East Technical University (Turkey), 2002; MS, 2006, PhD, 2009, Pennsylvania State University
- Ayalew, Beshah**, *Associate Professor, Automotive Engineering*. BS, Addis Ababa University (Ethiopia), 1997; MS, 2000, PhD, 2005, Pennsylvania State University
- Ayaz-Maierhafer, Birsen**, *Adjunct Assistant Professor, Environmental Engineering & Earth Sciences*. BS, 1986, MS, 1990, PhD, 1998, Istanbul Technical University (Turkey)
- Aziz, Nadim M.**, *Associate Provost, Provost & Vice President for Academic Affairs*. BSCE, 1978, MS, 1980, PhD, 1984, University of Mississippi
- Babu, Sabarish V.**, *Assistant Professor, School of Computing*. BS, 2000, MS, 2002, PhD, 2007, University of North Carolina-Charlotte
- Backman, Kenneth F.**, *Professor, Parks, Recreation & Tourism Management*. BS, Acadia University (Canada), 1980; MUP, 1985, PhD, 1989, Texas A&M University
- Backman, Sheila J.**, *Professor, Parks, Recreation & Tourism Management*. BSc, 1977, MR, 1979, Acadia University (Canada); PhD, Texas A&M University, 1988
- Baeza Migueles, Juan A.**, *Assistant Professor, Biological Sciences*. Licentiate, 1995, Master, 1999, Catholic University of the North (Chile); PhD, University of Louisiana at Lafayette, 2006
- Bagwell, Christopher E.**, *Adjunct Assistant Professor, Environmental Engineering & Earth Sciences*. BS, 1995, PhD, 2001, University of South Carolina
- Baier, Scott L.**, *Professor, Economics*. BS, 1988, MA, 1991, Bowling Green State University; PhD, Michigan State University, 1996
- Bailey, Beatrice N.**, *Professor, Teaching & Learning*. BA, Longwood College, 1978; MA, Bethany Theological Seminary, 1981; EdD, Virginia Tech, 1987
- Bain, Lisa J.**, *Professor, Biological Sciences*. BS, University of Georgia, 1992; PhD, North Carolina State University, 1997
- Baker, Caitlin E.**, *Lecturer, Communication Studies*. BA, Clemson University, 2010; MS, North Carolina State University, 2012
- Baker, George H.**, *Adjunct Professor, Bioengineering*. BS, University of Michigan, 1996; MD, Albany Medical College, 2001
- Baker, Susan S.**, *Adjunct Assistant Professor, Food, Nutrition, & Packaging Sciences*. BS, Meredith College, 1980; MEd, 1994, EdD, 2003, North Carolina State University
- Baldwin, Elizabeth D.**, *Associate Professor, Parks, Recreation & Tourism Management*. BA, Hollins College, 1989; MEd, Miami University, 1992; PhD, University of Maine, 2006
- Baldwin, Robert F.**, *Associate Professor, Forestry & Environmental Conservation*. BA, Colby College, 1985; MS, George Mason University, 1992; PhD, University of Maine, 2005
- Baldwin, William S.**, *Professor, Biological Sciences*. BS, Central Michigan University, 1989; PhD, North Carolina State University, 1995
- Ballato, Arthur D.**, *Adjunct Professor, Electrical & Computer Engineering*. BS, Massachusetts Institute of Technology, 1958; MS, Rutgers University, 1962; PhD, Polytechnic Institute of New York, 1972
- Ballato, John M.**, *Vice President, VP Economic Development & PSA*. BS, 1993, MS, 1995, PhD, 1997, Rutgers University
- Bao, Hua**, *Adjunct Professor, School of Materials Science & Engineering*. BS, 1984, MS, 1989, Tianjin University (China); PhD, East China University of Science and Technology (China), 1995
- Barattoni, Luca**, *Associate Professor, Languages*. BA, University of Bologna (Italy), 1996; MA, 2001, PhD, 2007, University of North Carolina
- Barcelona, Robert J., Jr.**, *Adjunct Professor, Youth Development Programs*. BA, University of Mississippi, 1993; MS, 1995, PhD, 2001, Indiana University
- Barczewski, Stephanie L.**, *Professor, History*. BA, Columbia University, 1990; PhD, Yale University, 1996
- Barfield, William R.**, *Adjunct Professor, Bioengineering*. BS, 1973, MA, 1974, Western Carolina University; PhD, Auburn University, 1993
- Barker, James F.**, *Professor, School of Architecture*. BArch, Clemson University, 1970; MArch, Washington University, 1973; FAIA
- Barkowski, Scott J.**, *Assistant Professor, Economics*. BA, 2000, MA, 2007, University of California-Los Angeles; PhD, University of California-Irvine, 2014
- Barnes, Edward M.**, *Adjunct Assistant Professor, Agricultural & Environmental Sciences*. BS, 1988, MS, 1990, North Carolina State University; PhD, Oklahoma State University, 1996
- Barr, Mary L.**, *Lecturer, Sociology*. BA, University of California-Los Angeles, 1998; MA, 2004, MPHIL, 2004, PhD, 2008, Yale University

- Barrett, David E.**, Associate Dean, School Of Education; Professor, Education & Human Development. BA, Wesleyan University, 1969; MS, 1973, PhD, 1974, University of Southern California
- Barrett, Russell K.**, Assistant Professor, Forestry & Environmental Conservation. BS, Middle Tennessee State University, 1999; MS, Missouri State University, 2002; PhD, Auburn University, 2009
- Barrios Hernandez, Carlos R.**, Assistant Professor, School of Architecture. BArch, University of The Andes (Venezuela), 1993; MArch, Pratt Institute, 1999; PhD, Massachusetts Institute of Technology, 2006
- Barron, Felix H.**, Professor, Food, Nutrition, & Packaging Sciences. BS, University of Chihuahua (Mexico), 1972; MS, Sapienza University of Rome (Italy), 1975; MS, Washington State University, 1982; PhD, Michigan State University, 1990
- Barth, Jeremy L.**, Adjunct Assistant Professor, Bioengineering. BS, Clemson University, 1987; PhD, University of Georgia, 1996
- Bartley, Abel A.**, Associate Professor, History. BA, 1987, MA, 1990, Ph.D., 1994, Florida State University
- Bateman, Ted A.**, Adjunct Associate Professor, Bioengineering. BA, DePauw University, 1992; MS, 1996, PhD, 1999, University of Colorado
- Bates, Celeste C.**, Assistant Professor, Education & Human Development. BA, 1991, MAT, 1993, University of South Carolina; PhD, Georgia State University, 2003
- Batt, Gregory S.**, Assistant Professor, Food, Nutrition, & Packaging Sciences. BS, University of Massachusetts-Amherst, 1994; MS, 2003, PhD, 2013, Clemson University
- Batt, Heather P.**, Senior Lecturer, Food, Nutrition, & Packaging Sciences. BA, Princeton University, 1995; PhD, Clemson University, 2001
- Battisto, Dina G.**, Associate Professor, School of Architecture. BArch, University of Tennessee, 1991; MArch, Clemson University, 1993; MS, 1996, PhD, 2004, University of Michigan
- Bauer, William A.**, Lecturer, Teaching & Learning. BA, 1969, MS, 1972, State University of New York-Fredonia
- Baum, Carl W.**, Associate Professor, Electrical & Computer Engineering. BS, University of California, 1987; MS, 1989, PhD, 1992, University of Illinois
- Bausman, Dennis C.**, Endowed Chair, Construction Science & Management. BS, Iowa State University, 1971; MCSM, Clemson University, 1995; PhD, Heriot-Watt University (Scotland), 2002
- Beasley, Donald E.**, Professor, Mechanical Engineering. BS, 1978, MS, 1980, Clemson University; PhD, University of Michigan, 1983
- Beasley, Virginia Leigh**, Adjunct Associate Professor, School of Nursing. BS, Emory University, 1980; MD, Medical College of Georgia, 1984
- Beckett, Joyce A.**, Lecturer, Teaching & Learning. BA, Rowan University, 1966; MA, College of New Jersey, 1972; PhD, Clemson University, 1996
- Bednar, Edward J.**, Adjunct Assistant Professor, Bioengineering. BA, 1978, MD, 1982, Wayne State University
- Beecher, Lance E.**, Lecturer, Agricultural & Environmental Sciences. BS, 1993, MS, 1996, Louisiana State University; PhD, Clemson University, 2013
- Bein, Amit**, Associate Professor, History. BA, 1996, MA, 2000, Tel Aviv University (Israel); PhD, Princeton University, 2006
- Bell, Phillip D.**, Adjunct Professor, Bioengineering. BS, Millsaps College, 1974; PhD, University of Alabama-Birmingham, 1980
- Bell, Zane W.**, Adjunct Professor, Environmental Engineering & Earth Sciences. BS, 1973, MS, 1973, Rensselaer Polytechnic Institute; PhD, University of Illinois, 1979; MS, University of Tennessee, 1986
- Bellinger, Robert G.**, Professor, Agricultural & Environmental Sciences. BS, 1974, MS, 1979, University of Maryland; PhD, Virginia Tech, 1985
- Belotti, Pietro L.**, Adjunct Assistant Professor, Mathematical Sciences. MSc, 1999, PhD, 2003, Politecnico di Milano University (Italy)
- Benedict, Robert C.**, Professor Of Practice, Planning, Development, & Preservation. BA, University of North Carolina-Charlotte, 1975; MBA, University of Georgia, 1976; MA, Goucher College, 1997; PhD, Clemson University, 2009
- Bennett, Delancy H. S.**, Assistant Professor, Marketing. BA, 1993, MBA, Wake Forest University, 2000; PhD, University of Massachusetts-Amherst, 2014
- Benson, Christopher A.**, Senior Lecturer, English. BA, 1987, MA, 1990, Clemson University
- Benson, Delwin E.**, Adjunct Professor, Forestry & Environmental Conservation. BS, 1971, MS, 1973, PhD, 1989, Colorado State University
- Benson, Eric P.**, Professor, Agricultural & Environmental Sciences. BS, University of Vermont, 1979; MS, Fairleigh Dickinson University, 1984; PhD, Clemson University, 1988
- Benson, Lisa C.**, Associate Professor, Engineering & Science Education. BS, University of Vermont, 1982; MS, 1986, PhD, 2002, Clemson University
- Benson, Sally M.**, Adjunct Professor, Environmental Engineering & Earth Sciences. BA, Columbia University, 1977; MS, 1984, PhD, University of California, 1988
- Bertholf, Gary J.**, Assistant Professor, English. BA, Colby College, 2006; MA, 2009, PhD, 2013, University of Pennsylvania
- Bertsch, Paul M.**, Adjunct Professor, Environmental Engineering & Earth Sciences. BS, University of Connecticut, 1978; MS, Virginia Tech, 1980; PhD, University of Kentucky, 1983
- Bhattacharya, Sriparna**, Research Assistant Professor, Physics & Astronomy. BSc, 1993, MSc, 1996, Calcutta University (India); PhD, Clemson University, 2003
- Bhattacharyya, Gautam**, Adjunct Assistant Professor, Chemistry. ScB, Brown University, 1992; AM, Harvard University, 1994; PhD, Purdue University, 2004
- Bielenberg, Douglas G.**, Associate Professor, Biological Sciences. BS, University of Northern Iowa, 1995; PhD, Pennsylvania State University, 2000
- Biggers, Sherrill B.**, Professor, Mechanical Engineering. BSCE, North Carolina State University, 1966; MS, 1970, PhD, 1971, Duke University
- Biggers, Sherry**, Senior Lecturer, Mathematical Sciences. BS, Auburn University, 1968; MAT, Duke University, 1971; PhD, Clemson University, 2006
- Bilbrey, Jerry K., Jr.**, Lecturer, Management. BS, Tennessee Technological University, 1996; MEng, University of South Carolina, 1999; PhD, University of Louisville, 2004
- Birrenkott, Glenn P., Jr.**, Professor, Animal & Veterinary Sciences. BS, 1973, MS, 1975, PhD, 1978, University of Wisconsin
- Bisesi, Joseph H., Jr.**, Adjunct Assistant Professor, Biological Sciences. BS, 2005, MS, 2007, PhD, 2011, Clemson University
- Bishop, David C.**, Adjunct Assistant Professor, Forestry & Environmental Conservation. BS, Presbyterian College, 1996; MS, University of Tennessee, 2000; PhD, Virginia Tech, 2005
- Bisson, Jennifer B.**, Lecturer, Psychology. BA, University of Virginia, 2007; MA, 2010, PhD, 2013, University of Connecticut
- Bix, Laura**, Adjunct Associate Professor, Food, Nutrition, & Packaging Sciences. BS, 1993, MS, 1998, PhD, 2001, Michigan State University
- Bixler, Robert D.**, Associate Professor, Parks, Recreation & Tourism Management. BA, 1981, MA, 1986, University of Louisville; PhD, Clemson University, 1994
- Blackwell, Amy H.**, Adjunct Professor, Forestry & Environmental Conservation. AB, Duke University, 1991; MA, Vanderbilt University, 1992; JD, University of Virginia, 1997; PhD, Clemson University, 2013
- Blakesley, David E.**, Endowed Chair, English. BA, 1983, MA, 1986, San Diego State University; PhD, University of Southern California, 1990
- Blenner, Mark A.**, Assistant Professor, Chemical & Biomolecular Engineering. BSE, Manhattan College, 2004; MS, 2006, PhD, 2009, Columbia University
- Bliznyuk, Valery N.**, Adjunct Professor, School of Materials Science & Engineering. MS, Kiev State University (Ukraine), 1978; PhD, Ukrainian Academy of Sciences (Ukraine), 1985; D.Sc., Taras Shevchenko National University of Kiev (Ukraine), 2004
- Blob, Richard W.**, Professor, Biological Sciences. BA, University of Pennsylvania, 1992; SM, 1995, PhD, 1998, University of Chicago
- Blouin, Vincent Y.**, Associate Professor, School of Architecture. BS, École Centrale de Nantes (France), 1993; MSE, 1999, PhD, 2001, University of Michigan
- Boatwright, Brandon C.**, Lecturer, Communication Studies. BS, 2010, MA, 2013, Clemson University
- Bodde, David L.**, Professor, Automotive Engineering. BS, United States Military Academy, 1965; MS, 1972, MS, 1973, Massachusetts Institute of Technology; PhD, Harvard University, 1976
- Bodenheimer, Lisa**, Librarian, University Libraries. BA, Mercer University, 1980; MAT, Vanderbilt University, 1983; MLS, Indiana University, 1986
- Bodenhorn, Howard N.**, Professor, Economics. BS, Virginia Tech, 1982; MA, 1987, MPhil, 1990, PhD, 1990, Rutgers University
- Boettcher, Michelle L.**, Assistant Professor, Educational & Organizational Leadership Development. BS, Iowa State University, 1990; MEd, University of Arkansas, 1996; PhD, Iowa State University, 2013
- Bohan Brown, Michelle M.**, Assistant Professor, Food, Nutrition, & Packaging Sciences. BS, 2000, PhD, 2010, Iowa State University
- Bolotova, Yuliya V.**, Assistant Professor, Agricultural & Environmental Sciences. BS, Moscow Timiryazev Agricultural Academy (Russia), 1998; PhD, Purdue University, 2006; LLM, University of Chicago, 2010
- Bonilla, Eddie A.**, Assistant Professor, Military Leadership; Captain, U.S. Army. BA, InterAmerican University of Puerto Rico, 1994; MBA, Columbia Southern University, 2010
- Boone, William R.**, Adjunct Professor, Animal & Veterinary Sciences; Director, Assisted Reproductive Technology and Andrology Laboratories, Greenville Hospital System. BS, University of Georgia, 1970; MS, 1972, PhD, 1977, Clemson University
- Booth, Brian W.**, Research Assistant Professor, Bioengineering. BS, Rochester Institute of Technology, 1995; PhD, North Carolina State University, 2004
- Bordia, Rajendra K.**, Department Head and Professor, School of Materials Science & Engineering. BT, Indian Institute of Technology (India), 1979; MS, 1981, PhD, 1986, Cornell University
- Borg, Thomas K.**, Adjunct Professor, Bioengineering. BS, 1965, MS, 1966, Colorado State University; PhD, University of Wisconsin, 1969
- Botchway, Portia A.**, Senior Lecturer, School of Nursing. BSN, Hampton Institute, 1975; MSN, University of Maryland, 1979
- Boudreau, Mark**, Adjunct Assistant Professor, Agricultural & Environmental Sciences. BS, University of Illinois, 1980; MS, University of Wisconsin, 1986; PhD, Oregon State University, 1991
- Bowers, Abigail L.**, Visiting Lecturer, Mathematical Sciences. BS, Furman University, 2008; MS, 2010, PhD, 2014, Clemson University
- Bowers, Edmond P.**, Assistant Professor, Youth Development Programs. BS, 2001, MEd, 2003, University of Notre Dame; PhD, Boston College, 2009
- Bowman, Larry S.**, Adjunct Professor, Bioengineering. BA, West Virginia University, 1969; MS, Clemson University, 1971; MD, Medical University of South Carolina, 1974
- Boyer, David M.**, Assistant Professor, Education & Human Development. BS, Shippensburg University of Pennsylvania, 1990; MEd, Harvard University, 2004; PhD, Michigan State University, 2011
- Brainerd, Edwin G., Jr.**, Associate Professor, Psychology. BA, Washington College, 1968; MA, 1971, PhD, 1974, West Virginia University
- Brame, Scott E.**, Research Assistant Professor, Environmental Engineering & Earth Sciences. BS, New Mexico Institute of Mining and Technology, 1983; MS, Clemson University, 1993
- Brandon, Steven C.**, Senior Lecturer, General Engineering. BS, 1983, MS, 1989, PhD, 2005, Clemson University
- Brannan, James R.**, Professor, Mathematical Sciences. BS, 1973, MS, 1976, Utah State University; PhD, Rensselaer Polytechnic Institute, 1979
- Brant, William A.**, Senior Lecturer, Languages. BA, Columbia International University, 1976; MEd, 1978, EdD, 1986, University of South Carolina
- Breazel, Ellen H.**, Lecturer, Mathematical Sciences. BS, Clemson University, 2000; MS, 2003, PhD, 2008, University of Georgia
- Brenner, Carol A.**, Adjunct Associate Professor, Bioengineering. BS, Queen Mary College University of London (England), 1976; PhD, Tufts University, 1986
- Bridges, William C., Jr.**, Alumni Professor, Mathematical Sciences. BS, University of North Carolina, 1980; MS, 1982, PhD, 1984, University of Nebraska
- Bridgwood, Joan**, Senior Lecturer, Languages. BA, University of Leeds (England), 1967; MA, 1989, DML, 2002, Middlebury College

- Brigmon, Robin L.**, *Adjunct Associate Professor, Environmental Engineering & Earth Sciences*. BS, 1979, MS, 1987, PhD, 1992, University of Florida
- Brinkman, Kyle S.**, *Associate Professor, School of Materials Science & Engineering*. BS, 1998, MS, 2000, Clemson University; PhD, Swiss Federal Institute of Technology (Switzerland), 2004
- Britt, Thomas W., Jr.**, *Professor, Psychology*. BA, College of William and Mary, 1988; MA, Wake Forest University, 1990; PhD, University of Florida, 1994
- Brittain, Sean D.**, *Associate Professor, Physics & Astronomy*. BS, Le Tourneau University, 1997; MS, 2002, PhD, 2004, University of Notre Dame
- Britz, Margaret T.**, *Professor, Sociology and Anthropology*. BS, Jacksonville State University, 1989; MS, 1992, PhD, 1994, Michigan State University
- Broderick, John S.**, *Adjunct Assistant Professor, Bioengineering*. BS, Furman University, 1988; MD, Vanderbilt University, 1992
- Brody, Aaron**, *Adjunct Professor, Food, Nutrition, & Packaging Sciences*. BS, 1951, PhD, 1957, Massachusetts Institute of Technology; MBA, Northeastern University, 1970
- Bronikowski, Michael G.**, *Adjunct Assistant Professor, Environmental Engineering & Earth Sciences*. BS, Marquette University, 1984; PhD, Purdue University, 1994
- Brookover, Robert S., IV**, *Senior Lecturer, Parks, Recreation & Tourism Management*. BS, 1993, MS, 1995, PhD, 2002, Clemson University
- Brooks, James R.**, *Adjunct Professor, Animal & Veterinary Sciences*. BS, Ohio State University, 1977; MS, 1981, PhD, 1984, Clemson University
- Brooks, Johnell O.**, *Associate Professor, Automotive Engineering*. BA, 1998, MS, 2002, PhD, 2005, Clemson University
- Brooks, Richard R.**, *Professor, Electrical & Computer Engineering*. BA, Johns Hopkins University, 1979; PhD, Louisiana State University, 1996
- Broome, Ann-Marie**, *Adjunct Associate Professor, Bioengineering*. BA, University of Tennessee, 1988; MS, 1994, PhD, 1998, University of South Carolina
- Broome, Charles B.**, *Adjunct Assistant Professor, Bioengineering*. BBA, Texas Tech University, 2000; MD, Texas Tech University Health Sciences Center, 2006
- Brosnan, Denis A.**, *Director, Ceramic Center; Professor, School of Materials Science & Engineering*. BS, 1967, MS, 1968, Clemson University; PhD, Iowa State University, 1972; PE
- Brown, Christy J.**, *Lecturer, Mathematical Sciences*. BS, 2004, MS, 2010, PhD, 2013, University of Georgia
- Brown, Derek A.**, *Assistant Professor, Mathematical Sciences*. BS, Georgia Institute of Technology, 2006; MS, 2010, PhD, 2013, University of Georgia
- Brown, James L.**, *Associate Professor, Mathematical Sciences*. BS, Michigan State University, 1998; PhD, University of Michigan, 2005
- Brown, Jason S.**, *Lecturer, Physics & Astronomy*. BS, University of Illinois, 1993; MS, 1996, PhD, 1999, Clemson University
- Brown, Nicholas C.**, *Assistant Professor, English*. BA, Columbia University, 2004; MFA, University of Iowa, 2006
- Brown, Philip J., Swetenburg**, *Professor, School of Materials Science & Engineering*. BSc, 1987, PhD, 1991, University of Leeds (England)
- Brown, Truman R.**, *Adjunct Professor, Bioengineering*. BS, 1964, PhD, 1970, Massachusetts Institute of Technology
- Bruce, David A.**, *Professor, Chemical & Biomolecular Engineering*. BS, 1991, MS, 1992, PhD, 1994, Georgia Institute of Technology
- Bruce, Terri F.**, *Academic Program Director, Clemson Light Imaging Facility*. BS, 1993, BSCh, 1993, Georgia Institute of Technology; PhD, Clemson University, 2009
- Bruch, John S.**, *Adjunct Associate Professor, Bioengineering*. BA, 1981, MD, 1985, University of Virginia
- Bruhns, Robert A.**, *Senior Lecturer, School of Architecture*. BS, Clemson University, 1983; MArch, Georgia Institute of Technology, 1988
- Brumagim, Julia**, *Associate Professor, Chemistry*. AB, Harvard University, 1994; PhD, University of Illinois, 1999
- Bruner, Richard H.**, *Adjunct Professor, Animal & Veterinary Sciences*. BS, Clemson University, 1974; DVM, University of Georgia, 1967
- Buffington, Dennis E.**, *Adjunct Professor, Agricultural & Environmental Sciences*. BS, 1966, MS, 1967, Pennsylvania State University; PhD, University of Minnesota, 1971
- Burati, James L., Jr.**, *Professor, Civil Engineering*. BS, Virginia Tech, 1974; MS, Ohio State University, 1975; PhD, Pennsylvania State University, 1984
- Buresh, Robert E.**, *Adjunct Professor, Animal & Veterinary Sciences*. BS, 1980, MS, 1982, Clemson University; PhD, University of Florida, 1985
- Burg, Timothy C.**, *Adjunct Associate Professor, Electrical & Computer Engineering*. BS, University of Cincinnati, 1988; MS, 1990, PhD, 1996, Clemson University
- Burgett, Joseph M.**, *Assistant Professor, Construction Science & Management*. BS, 2002, MS, 2011, PhD, 2013, University of Florida
- Burk, Brenda L.**, *Associate Librarian, University Libraries*. BA, 1990, MA, 1994, University of Wisconsin
- Burns, Alan C.**, *Associate Librarian, University Libraries*. BS, Weber State University, 1994; MLS, Indiana University, 1996; MA, Indiana University-Purdue University-Indianapolis, 1996
- Burns, James M.**, *Professor, History*. BA, University of California-Los Angeles, 1985; Graduate Diploma, University of Cambridge (England), 1986; MA, 1993, PhD, 1998, University of California-Santa Barbara
- Burns, Matthew G.**, *Adjunct Assistant Professor, Animal & Veterinary Sciences*. BS, 2005, PhD, 2012, Clemson University; MS, Kansas State University, 2007
- Burns, Sarah B.**, *Adjunct Assistant Professor, Agricultural & Environmental Sciences*. BS, 1980, MEd, 1994, Clemson University
- Burr, Meredith N.**, *Lecturer, Mathematical Sciences*. BA, Providence College, 2005; MS, 2007, PhD, 2010, Tufts University
- Burr, Michael A.**, *Assistant Professor, Mathematical Sciences*. BS, 2004, MS, 2006, Tufts University; MS, 2009, PhD, 2010, New York University
- Burton, Orville V.**, *Professor, History; Adjunct Professor, Sociology*. BA, Furman University, 1969; PhD, Princeton University, 1976
- Busby, Terry K.**, *Lecturer, School of Nursing*. BS, 1989, MS, 1998, Clemson University
- Bushnell, Cameron F.**, *Associate Professor, English*. BS, Montana State University-Bozeman, 1975; MA, 1992, MA, 2001, PhD, 2007, University of Maryland
- Buskey, Frederick C.**, *Lecturer, Educational & Organizational Leadership Development*. BA, Humboldt State University, 1985; MA, Ohio State University, 1987; EdD, Bowling Green State University, 2004
- Buyer, Paul L.**, *Professor, Performing Arts; Director of Percussion; Director of Music*. BS, Ball State University, 1992; MM, 1994, DMA, 1999, University of Arizona
- Byrd, Alex P.**, *Assistant Professor, Agricultural & Environmental Sciences*. BS, 2004, MS, 2011, Virginia Tech; PhD, Iowa State University, 2014
- Cadorete, Deborah J.**, *Lecturer, Educational & Organizational Leadership Development*. BS, Towson University, 1973; MEd, University of Miami, 1989; EdS, Nova Southeastern University, 2003
- Caine, Kelly E.**, *Assistant Professor, School of Computing*. BS, University of South Carolina, 2002; MS, 2006, PhD, 2010, Georgia Institute of Technology
- Calkin, Neil J.**, *Professor, Mathematical Sciences*. BA, 1984, MA, 1986, University of Cambridge (England); PhD, University of Waterloo (Canada), 1988
- Cameron, Albert Neill, Jr.**, *Vice President, Advancement; Adjunct Professor, Marketing*. BS, Georgia State University, 1972; MBA, Emory University, 1982
- Campbell, Barbara J.**, *Assistant Professor, Biological Sciences*. BS, State University of New York-Genesee, 1982; PhD, Cornell University, 1993
- Campbell, Benjamin T.**, *Adjunct Associate Professor, Agricultural & Environmental Sciences*. BS, North Carolina State University, 1996; MS, 1999, PhD, 2002, University of Nebraska
- Campbell, Carl M.**, *Lecturer, Educational & Organizational Leadership Development*. BS, University of South Carolina, 1972; MEd, 1981, EdS, 1989, PhD, 2000, Clemson University
- Campbell, Jonathan**, *Adjunct Assistant Professor, Animal & Veterinary Sciences*. BS, 2000, MS, 2006, Clemson University; PhD, Iowa State University, 2012
- Campbell, Robert L.**, *Professor, Psychology*. BA, Harvard University, 1974; PhD, University of Texas, 1986
- Cantalupo, Claudio**, *Associate Professor, Psychology*. BS, University of Padua (Italy), 1994; MS, 1998, PhD, 2000, University of Memphis
- Cao, Min**, *Associate Professor, Biological Sciences*. BS, East China University of Science and Technology (China), 1994; PhD, Cornell University, 2002
- Cao, Weiguo**, *Professor, Genetics & Biochemistry*. BS, Wuhan University (China), 1983; PhD, University of Idaho, 1992
- Cardelus, Catherine L.**, *Adjunct Assistant Professor, Biological Sciences*. BA, Barnard College, 1996; PhD, University of Connecticut, 2002
- Carney, Elizabeth D.**, *Professor, History; Carol K. Brown Endowed Scholar in Humanities, History*. BA, Smith College, 1969; MA, 1973, PhD, 1975, Duke University
- Carpio, Carlos E.**, *Adjunct Associate Professor, Agricultural & Environmental Sciences*. BS, Escuela Agricola Panamericana (Honduras), 1999; MSc, Texas Tech University, 2002; PhD, North Carolina State University, 2006
- Carraway, Elizabeth R.**, *Associate Professor, Environmental Engineering & Earth Sciences*. BS, 1981, PhD, 1989, University of Virginia
- Carsten, Christopher G., III**, *Adjunct Associate Professor, Bioengineering*. BS, Clemson University, 1988; MD, Medical University of South Carolina, 1992
- Carver, Brian T.**, *Assistant Professor, School of Accountancy & Finance*. BS, 1993, MS, 1995, PhD, 2008, University of Tennessee
- Casabianca, Leah B.**, *Assistant Professor, Chemistry*. BS, Rice University, 2002; PhD, Georgetown University, 2008
- Cason, Katherine L.**, *Professor, Food, Nutrition, & Packaging Sciences*. BS, Pennsylvania State University, 1982; MS, Texas Woman's University, 1985; PhD, Virginia Tech, 1988
- Castle, James W.**, *Professor, Environmental Engineering & Earth Sciences*. BS, Allegheny College, 1972; MS, University of Wisconsin, 1974; PhD, University of Illinois, 1978
- Caterino, Michael S., John C. & Suzanne E. Morse Endowed Chair in Arthropod Biodiversity, Agricultural & Environmental Sciences. BS, University of Mississippi, 1992; PhD, University of California, 1998**
- Cates, Ezra L.**, *Assistant Professor, Environmental Engineering & Earth Sciences*. BS, University of North Carolina-Asheville, 2007; PhD, Georgia Institute of Technology, 2013
- Cawood, Mark E.**, *Senior Lecturer, Mathematical Sciences*. BS, Manchester College, 1987; MS, 1990, PhD, 1994, Clemson University
- Cawthon, Tony W.**, *Alumni Professor, Educational & Organizational Leadership Development*. BA, 1981, MA, 1983, University of Tennessee; PhD, Mississippi State University, 1995
- Chalil Madathil, Kapil**, *Research Assistant Professor, Industrial Engineering*. BTech, Vellore Institute of Technology (India), 2006; MS, 2010, PhD, 2013, Clemson University
- Champaigne, Kevin D.**, *Research Assistant Professor, Bioengineering*. BS, University of Rochester, 1994; MS, 2012, PhD, 2013, Clemson University
- Chancellor, Anna-Marie V.**, *Associate Professor, Parks, Recreation & Tourism Management*. BS, Longwood College, 1994; MS, 2001, PhD, 2004, University of Florida
- Chancellor, Herbert C.**, *Associate Professor, Parks, Recreation & Tourism Management*. BS, Western Carolina University, 1985; MA, Appalachian State University, 1987; MEd, Bowling Green State University, 1993; PhD, Clemson University, 2005
- Chandrasekaran, Srikrupa**, *Lecturer, Genetics & Biochemistry*. BS, University of Mumbai (India), 1998; MS, Maharaja Sayajirao University of Baroda (India), 2000; PhD, Louisiana State University Health Sciences Center, 2006
- Chang, Hyejung**, *Assistant Professor, Landscape Architecture*. BS, University of Seoul (Korea), 1992; MLA, University of Minnesota, 2001; PhD, North Carolina State University, 2009
- Chang, Zheng**, *Adjunct Associate Professor, Environmental Engineering & Earth Sciences*. BS, 1984, MS, 1989, Lanzhou University (China); PhD, Tokyo Institute of Technology (Japan), 1996
- Chapman, Susan Caroline**, *Associate Professor, Biological Sciences*. BSc, Open University (England), 1999; BSc, University College University of London (England), 1998; PhD, King's College - London (England), 2002
- Chapman, Wayne K.**, *Professor, English*. BS, 1972, MA, 1977, Portland State University; PhD, Washington State University, 1988
- Chastain, John P.**, *Professor, Agricultural & Environmental Sciences*. BS, University of Georgia, 1982; MS, 1987, PhD, 1991, University of Kentucky; EIT

- Che, Stacy M.**, Associate Professor, Teaching & Learning. MS, Colorado State University, 1997; BS, 1995, PhD, 2005, University of Oklahoma
- Cheatham, Harold E.**, Adjunct Faculty, Center for Research on Health Disparities. BS, Pennsylvania State University, 1961; MA, Colgate University, 1969; PhD, Case Western Reserve University, 1973
- Chen, Chin-Fu**, Adjunct Assistant Professor, Biological Sciences. BS, 1981, MS, 1983, National Taiwan University (Taiwan); MA, 1991, PhD, 1997, State University of New York-Stony Brook
- Chen, Feng**, Professor, Food, Nutrition, & Packaging Sciences. BS, Shanghai Fisheries University (China), 1990; MS, Wuxi Institute of Light Industry (China), 1992; PhD, Louisiana State University, 1997
- Chen, Liwei**, Assistant Professor, Public Health. MD, Xi'an Jiaotong University (China), 1996; MS, Iowa State University, 2003; MHS, 2005, PhD, 2008, Johns Hopkins University
- Chen, Qingshan**, Assistant Professor, Mathematical Sciences. BS, Fudan University (China), 2002; MA, 2004, PhD, 2009, Indiana University
- Chen, Qiushi**, Assistant Professor, Civil Engineering. BS, Shanghai Jiao Tong University, 2006; MS, 2009, PhD, 2011, Northwestern University
- Chen, Su-I**, Lecturer, Languages. BA, National Taiwan Normal University (Taiwan), 1984; MA, 1996, PhD, 1998, State University of New York-Stony Brook
- Chen, Wen Y.**, Professor, Biological Sciences. DDS, Shanghai Second Medical College (China), 1982; MS, 1987, PhD, 1991, Ohio University
- Chernykh, Lyudmila A.**, Assistant Professor, School of Accountancy & Finance. PhD, Voronezh State University (Russia), 1999; PhD, Drexel University, 2005
- Childers, Ashley K.**, Research Assistant Professor, Industrial Engineering. BS, 2006, MS, 2007, PhD, 2010, Clemson University
- Childress, Michael J.**, Associate Professor, Biological Sciences. BS, University of Tampa, 1987; MA, University of California, 1990; PhD, Florida State University, 1995
- Cho, Byung Rae**, Associate Professor, Industrial Engineering. BS, Kyung Hee University (Korea), 1982; MS, Ohio State University, 1985; PhD, University of Oklahoma, 1994
- Choi, Hong Seok**, Assistant Professor, Mechanical Engineering. BS, Yeungnam University (Korea), 1997; MS, 2002, PhD, 2007, University of Wisconsin
- Chong, Juang Horng**, Associate Professor, Agricultural & Environmental Sciences. BS, University of Arizona, 1999; MS, 2001, PhD, 2005, University of Georgia
- Chow, Alex T.**, Assistant Professor, Forestry & Environmental Conservation, Belle W. Baruch Institute of Coastal Ecology and Forest Science; Assistant Professor, Biosystems Engineering. BS, University of California, 1994; MS, 1998, PhD, 2000, University of California-Davis
- Chowdhury, Mashrur A.**, Professor, Civil Engineering. BS, Bangladesh Institute of Technology (Bangladesh), 1988; MS, Morgan State University, 1991; PhD, University of Virginia, 1995; PE
- Christensen, Kenneth A.**, Associate Professor, Chemistry. BS, Brigham Young University, 1992; PhD, University of Michigan, 1997
- Chumanov, George**, Professor, Chemistry. MS, Moscow Physico-Technical Institute (Russia), 1982; PhD, Moscow State University (Russia), 1988
- Cicimurri, Christian M.**, Adjunct Lecturer, Environmental Engineering & Earth Sciences. BA, Rutgers University, 1993; MS, South Dakota School of Mines and Technology, 1999
- Clark, Katherine D.**, Senior Lecturer, Management. BS, College of Charleston, 1975; MHR, University of South Carolina, 1986
- Clark, Leigh Anne**, Assistant Professor, Genetics & Biochemistry. BS, 2000, PhD, 2004, Texas A&M University
- Clarke, Shima N.**, Professor, Construction Science & Management. BSCE, 1980, MS, 1985, PhD, 1997, University of Tennessee
- Clements, James P.**, President, Clemson University; Professor, School of Computing. BS, 2015, MS, 2015, PhD, 2015, University of Maryland-Baltimore County; MS, Johns Hopkins University, 2015
- Coakley, Laura L.**, Lecturer, Teaching & Learning. BS, Auburn University, 1995; MEd, Columbia College, 2004
- Cochrane, Gordon M.**, Associate Librarian, University Libraries. BA, Hillsdale College, 1989; MLS, University of South Carolina, 1992
- Coffee, Aubrey D.**, Senior Lecturer, Food, Nutrition, & Packaging Sciences. BS, Johnson and Wales University, 1998; PhD, Clemson University, 2005
- Coggeshall, John M.**, Professor, Anthropology. BA, 1975, MA, 1978, PhD, 1984, Southern Illinois University
- Cohen, Peter A.**, Senior Lecturer, Philosophy & Religion. BA, Springfield College, 1979; MA, 1981, PhD, 1992, Florida State University
- Cohen, Robert S.**, Department Head and Professor, Biological Sciences. BA, University of Delaware, 1978; PhD, University of Southern California, 1982
- Colbath, Gregory P.**, Adjunct Assistant Professor, Bioengineering. BA, University of the South, 1997; MS, Georgia State University, 2000; MD, Medical University of South Carolina, 2007
- Cole, Michael A.**, Senior Lecturer, Management. BA, Saint Louis University, 1974; MA, Western Kentucky University, 1976; PhD, Georgia State University, 1983
- Cole, Mikel W.**, Assistant Professor, Teaching & Learning. BA, Baylor University, 1997; MEd, Chaminade University of Honolulu, 2002; PhD, Vanderbilt University, 2012
- Cole, Stephen E.**, Department Head, Plant Industry. BS, 1993, MS, 1997, University of Tennessee; EdD, University of Georgia, 2010
- Collins, Carol A.**, Senior Lecturer, Performing Arts. BA, Eckerd College, 1975; MA, Eastern Michigan University, 1978; MFA, Yale University, 1985
- Collins, Edward R., Jr.**, Executive Director for Academic Initiatives, College of Engineering & Science; Professor, Electrical and Computer Engineering. BS, North Carolina State University, 1984; PhD, Georgia Institute of Technology, 1989
- Colthorpe, Christopher A.**, Associate Librarian, University Libraries. BA, 1973, MA, 1974, York University (Canada); MA, Western Carolina University, 1976; MLIS, University of South Carolina, 1999
- Comfort, Janice G.**, Librarian, University Libraries. BS, West Virginia University, 1981; MLS, University of Pittsburgh, 1991
- Condrasky, Margaret D.**, Associate Professor, Food, Nutrition, & Packaging Sciences. BS, Pennsylvania State University, 1977; MS, Indiana University of Pennsylvania, 1983; EdD, Clemson University, 1993
- Conner, William H.**, Professor, Forestry & Environmental Conservation. BS, Virginia Tech, 1973; MS, 1975, PhD, 1988, Louisiana State University
- Connor, Dean M., Jr.**, Adjunct Assistant Professor, Bioengineering. BS, University of Wisconsin-Platteville, 2000; MS, 2003, PhD, 2006, North Carolina State University
- Conway, John E., III**, Lecturer, English. BA, Ohio State University, 1992; MA, Western Michigan University, 1996; MFA, Southern Illinois University, 1999; PhD, University of South Carolina, 2011
- Cook, Michelle P.**, Associate Professor, Teaching & Learning. BS, 1997, MAT, 1998, University of North Carolina; PhD, North Carolina State University, 2006
- Cooksey, Kay D.**, Professor and Cryovac Chair, Food, Nutrition, & Packaging Sciences. BS, Purdue University, 1984; MS, Indiana State University, 1985; PhD, University of Illinois, 1992
- Cooksey, Robert C.**, Adjunct Professor, Food, Nutrition, & Packaging Sciences. BS, 1957, MA, 1962, Ball State University; EdD, University of Maryland, 1973
- Coombs, David S.**, Assistant Professor, English. BA, Indiana University, 2000; MA, 2007, PhD, 2011, Cornell University
- Cooper, C. Camille**, Associate Librarian, University Libraries. BA, Davidson College, 1989; MA, University of Georgia, 1992; MLIS, University of Texas, 1997
- Cooper, Sarah M.**, Lecturer, English. BA, Clemson University, 2007; MA, Purdue University, 2010
- Corbett, Joel T.**, Adjunct Assistant Professor, Bioengineering. BS, 1991, MS, 1994, PhD, 2000, Clemson University
- Corbin, Victoria L.**, Academic Program Director, DNA Learning Center. BA, Pacific Lutheran University, 1980; PhD, Harvard University, 1989
- Cornelius, Christopher J.**, Adjunct Professor, Chemistry. BS, Montana State University-Bozeman, 1994; ME, 1998, PhD, 2000, Virginia Tech
- Corzine, Keith A.**, Named Professor, Electrical & Computer Engineering. BS, 1992, MS, 1994, PhD, 1997, University of Missouri-Rolla
- Costa, Ralph**, Adjunct Assistant Professor, Forestry & Environmental Conservation. BS, 1973, MS, 1976, University of Arizona
- Cottingham, Judith E.**, Senior Lecturer, Mathematical Sciences. BS, University of Louisiana at Monroe, 1987; MS, 1989, PhD, 1993, Clemson University
- Coulson, Alan B.**, Lecturer, Environmental Engineering & Earth Sciences. BS, Bowling Green State University, 1996; MS, Texas Tech University, 1998; PhD, University of South Carolina, 2009
- Cousins, Thomas E.**, Professor, Civil Engineering. BS, 1978, MS, 1982, Clemson University; PhD, North Carolina State University, 1986
- Coutris, Nicole G.**, Senior Lecturer, Mechanical Engineering. B, 1965, M, 1967, DSc, 1980, Pierre and Marie Curie University - Paris VI (France)
- Coverdale, Josie A.**, Adjunct Assistant Professor, Animal & Veterinary Sciences. BS, Texas A&M University, 1998; MS, 2000, PhD, 2003, Iowa State University
- Cox, Christopher L.**, Professor, Mathematical Sciences. BS, Grove City College, 1978; MS, 1980, PhD, 1984, Carnegie Mellon University
- Cox, Kern T.**, Lecturer, Graphic Communications. BS, 1997, MINED, 1999, Clemson University
- Coykendall, James B., IV**, Department Head and Professor, Mathematical Sciences. BS, California Institute of Technology, 1989; PhD, Cornell University, 1995
- Craig, Starlett R.**, Director, Outreach and Enrichment, Office of Academic Excellence. BA, Spelman College, 1969; MSS, Bryn Mawr College, 1971
- Crandall, Lee A.**, Professor, Public Health. BA, State University of New York-Potsdam, 1969; MS, 1973, PhD, 1976, Purdue University
- Crawford, Charles C.**, Assistant Professor, Military Leadership; Captain, U.S. Army. BS, University of South Alabama, 2006
- Crawford, Thomas M.**, Adjunct Associate Professor, School of Materials Science & Engineering. BS, Haverford College, 1992; MS, 1995, PhD, 1997, University of Colorado
- Creager, Stephen E.**, Professor, Chemistry. BS, Rensselaer Polytechnic Institute, 1982; PhD, University of North Carolina, 1987
- Crette, Stephanie A.**, Adjunct Professor, School of Materials Science & Engineering. BS, University of Montpellier II (France), 1994; PhD, University of North Carolina, 2001
- Cridland-Hughes, Susan A.**, Assistant Professor, Teaching and Learning. BA, Rhodes College, 2001; MAT, Johns Hopkins University, 2003; PhD, Emory University, 2010
- Cross, James E.**, Librarian, University Libraries. BA, Cleveland State University, 1979; MA, MLS, Case Western Reserve University, 1982
- Csernak, Stephen F.**, Senior Lecturer, Civil Engineering. BS, 1974, MS, 1976, Clemson University
- Culin, Joseph D.**, Associate Dean for Research and Graduate Studies, College of Agriculture, Forestry, & Life Sciences; Professor, Agricultural & Environmental Sciences. BA, Eastern College, 1975; MS, University of Delaware, 1977; PhD, University of Kentucky, 1981
- Cummings, John R.**, Senior Lecturer, Biological Sciences. BS, 1983, MS, 1988, Bowling Green State University
- Cunningham, Miller G.**, Associate Professor, Planning, Development, & Preservation. BA, Duke University, 1979; MA, University of South Carolina, 1985; PhD, Clemson University, 1995
- Curtis, Katherine A.**, Assistant Professor, Political Science. BA, 2005, MA, 2009, PhD, 2013, University of Colorado
- Cushing, Tamara L.**, Adjunct Associate Professor, Forestry & Environmental Conservation. BS, University of Florida, 1996; MTX, 1999, MS, 1999, Mississippi State University; PhD, University of Georgia, 2006
- Daily, Shaundra B.**, Associate Professor, School of Computing. BS, Florida State University, 2001; MS, Florida A&M University, 2003; MS, 2005, PhD, 2010, Massachusetts Institute of Technology
- Dale, Michael A.**, Assistant Professor, Environmental Engineering & Earth Sciences. MSc, University of Bristol (England), 2006; PhD, University of Canterbury (New Zealand), 2011
- Dalton, Derek W.**, Assistant Professor, School of Accountancy & Finance. BA, Northwestern College, 2003; MPAcc, University of South Dakota, 2006; PhD, Texas Tech University, 2010; CPA (Iowa)
- Daqaq, Mohammed F.**, Associate Professor, Mechanical Engineering. BS, Jordan University of Science and Technology (Jordan), 2001; MS, 2003, PhD, 2006, Virginia Tech

- Darby, Duncan O.**, Associate Professor, Food, Nutrition, & Packaging Sciences. BS, 1981, MEng, 1982, PhD, 2003, University of Louisville
- Darnault, Christophe**, Assistant Professor, Environmental Engineering & Earth Sciences. BS, 1995, MS, 1995, Lille Catholic University (France); PhD, Cornell University, 2000
- Daum, Matthew P.**, Adjunct Associate Professor, Food, Nutrition, & Packaging Sciences. BS, 1992, MS, 1994, PhD, 1999, Michigan State University
- Davidson, Randy E.**, Senior Lecturer, Mathematical Sciences. BS, Tulane University, 1976; MS, Lehigh University, 1978
- Davis, Alexis Z.**, Lecturer, Communication Studies. BA, Clemson University, 2002; MA, Auburn University, 2005
- Davis, Alyssa C.**, Lecturer, Communication Studies. BA, Mary Washington College, 2010; MA, University of North Carolina-Greensboro, 2012
- Davis, Betsy K.**, Adjunct Associate Professor, Bioengineering. BS, Wofford College, 1983; DMD, Medical University of South Carolina, 1987; MS, University of Iowa, 1989
- Davis, James R.**, Senior Lecturer, Forestry & Environmental Conservation. BS, University of Georgia, 1977; MS, 1984, PhD, 1992, Clemson University
- Davis, Roy B.**, Adjunct Professor, Bioengineering. BS, 1977, MS, 1979, PhD, 1983, Virginia Tech
- Davis, Stephanie C.**, Associate Professor, School of Nursing. BS, Armstrong Atlantic State University, 1998; MSN, Georgia Southern University, 2001; PhD, University of South Carolina, 2005
- Davis, Timothy A.**, Associate Professor, School of Computing. BS, College of William and Mary, 1987; MCS, University of Virginia, 1989; PhD, North Carolina State University, 1998
- Davis, W. Jeffrey**, Adjunct Associate Professor, Civil Engineering. BS, University of Alabama, 1981; MS, Auburn University, 1987; PhD, Georgia Institute of Technology, 1997
- Daw, Murray S.**, R. A. Bowen Professor of Physics, Physics & Astronomy. BS, University of Florida, 1976; PhD, California Institute of Technology, 1981
- Dawson, Paul L.**, Professor, Food, Nutrition, & Packaging Sciences. BS, Salisbury State University, 1979; MS, University of Florida, 1986; PhD, North Carolina State University, 1989
- De Iulio, Edward B.**, Assistant Director and Senior Lecturer, CBBS Undergraduate Advising Center. BS, 1975, MS, 1976, Georgia Institute of Technology
- Dean, Brian C.**, Associate Professor, School of Computing. BS, 1999, BS, 1999, MEng, 1999, PhD, 2004, Massachusetts Institute of Technology
- Dean, Delphine**, Associate Professor, Bioengineering. BS, 2001, ME, 2001, PhD, 2005, Massachusetts Institute of Technology
- Deaton, Cynthia M.**, Associate Professor, Teaching & Learning. BS, Valdosta State University, 1998; MEd, Georgia Southern University, 2001; PhD, University of Georgia, 2007
- Delhay, Jean-Marc G.**, Senior Lecturer, Mechanical Engineering. Diploma of Engineering, 1964, Doctor of Science, 1970, Grenoble Institute of Technology (France)
- Delmas, Candice**, Assistant Professor, Philosophy & Religion. Licence, 2001, Matrice, 2002, University of Paris X-Nanterre (France); Master, University of Paris-Sorbonne (France), 2006; MA, Georgia State University, 2006; PhD, Boston University, 2012
- DeLuca, Jane M.**, Assistant Professor, School of Nursing. BS, City University of New York-Hunter College, 1988; MS, Columbia University, 1991; PhD, University of Rochester, 2010
- Demirkanli, Deniz I.**, Adjunct Professor, Environmental Engineering & Earth Sciences. BS, Marmara University (Turkey), 1998; MS, 2002, PhD, 2006, Clemson University
- Denham, Bryan E.**, Charles Campbell Professor of Sports Communication, Communication Studies. BA, Indiana University, 1989; MA, California State University, 1993; PhD, University of Tennessee, 1996
- Desjardins, John D.**, Associate Professor, Bioengineering. BS, Carnegie Mellon University, 1992; MS, University of Pittsburgh, 1994; PhD, Clemson University, 2006
- Detrich, David M.**, Professor, Art. BFA, Kansas City Art Institute, 1980; MFA, Alfred University, 1982
- Devol, Timothy A.**, Professor, Environmental Engineering & Earth Sciences. BS, Ohio State University, 1987; MS, 1988, PhD, 1993, University of Michigan
- DeWalt, Saara J.**, Associate Professor, Biological Sciences. AB, Brown University, 1994; PhD, Louisiana State University, 2003
- Dewberry, Raymond A.**, Adjunct Professor, Environmental Engineering & Earth Sciences. BS, Virginia Tech, 1974; PhD, Florida State University, 1980
- DiBenedetto, Catherine.**, Assistant Professor, Agricultural & Environmental Sciences. BS, 1992, MS, 2009, University of Delaware; PhD, University of Florida, 2015
- Dieter, R. Karl**, Department Head and Professor, Chemistry. BS, Lehigh University, 1973; PhD, University of Pennsylvania, 1981
- Diller, Thomas W.**, Adjunct Professor, Industrial Engineering. BA, Illinois Wesleyan University, 1978; MD, Southern Illinois University, 1983; MS, Carnegie Mellon University, 2003
- Dimitrova, Elena S.**, Associate Professor, Mathematical Sciences. BA, American University (Bulgaria), 2001; MS, 2003, PhD, 2006, Virginia Tech
- Ding, Feng**, Assistant Professor, Physics & Astronomy. BS, Nanjing University (China), 1997; MS, 2001, PhD, 2004, Boston University
- DiPrete, David P.**, Adjunct Associate Professor, Environmental Engineering & Earth Sciences. BS, Rensselaer Polytechnic Institute, 1988; PhD, University of Kentucky, 1994
- Dittrich-Reed, Dylan R.**, Assistant Professor, Biological Sciences. BS, University of California-Davis, 2005; PhD, University of Tennessee, 2013
- Dixon, Lindsey C.**, Lecturer, Communication Studies. BS, Ball State University, 2010; MS, Illinois State University, 2012
- Dobbins, Thomas R.**, Extension Director, Cooperative Extension Services. BS, 1982, MAg, 1988, Clemson University; PhD, Virginia Tech, 1999
- Dominy, Brian N.**, Associate Professor, Chemistry. BS, Carnegie Mellon University, 1995; PhD, Scripps Research Institute, 2001
- Donar, David S.**, Associate Professor, Art. BFA, Eastern Michigan University, 1993; MFA, Bowling Green State University, 2004
- Dong, Liang**, Associate Professor, Electrical & Computer Engineering. BSc, Harbin Institute of Technology (China), 1985; MSc, University of Manchester (England), 1987; PhD, University of Southampton (England), 1991
- Dong, Yuqing**, Assistant Professor, Biological Sciences. BS, East China University of Science and Technology (China), 1994; PhD, Peking University (China), 1999
- Dooley, R. Larry**, Interim Vice President, Research; Professor, Bioengineering. BS, Virginia Tech, 1968; MS, 1973, PhD, 1976, Clemson University
- Dorcas, Michael**, Adjunct Associate Professor, Forestry & Environmental Conversation. BS, 1986, MS, 1990, University of Texas-Arlington; PhD, 1995, Idaho State University
- Dorsch, Michael J.**, Professor, Marketing. BS, University of Wisconsin-La Crosse, 1978; MBA, Arizona State University, 1980; PhD, University of Arkansas, 1987
- Dorsey, Lydia J.**, Lecturer, Art. BA, 2010, MA, 2013, Louisiana State University
- Dosmann, Michael S.**, Adjunct Assistant Professor, Agricultural & Environmental Sciences. BS, Purdue University, 1996; MS, Iowa State University, 1998; PhD, Cornell University, 2006
- Dou, Zhicheng**, Assistant Professor, Biological Sciences. BS, Fudan University, 2002; PhD, University of Southern Mississippi, 2009
- Dougan, William R.**, Alumni Professor, Economics. BA, University of Virginia, 1971; MA, 1976, PhD, 1981, University of Chicago
- Dourra, Hussein**, Adjunct Professor, Automotive Engineering. MBA, 1999, PhD, 2000, Wayne State University
- Dowler, William M.**, Adjunct Professor, Agricultural & Environmental Sciences. BS, 1954, MS, 1958, University of Missouri; PhD, University of Illinois, 1961
- Downes, Theron**, Adjunct Professor, Food, Nutrition, & Packaging Sciences. BA, Lehigh University, 1966; MS, 1970, PhD, 1972, Rutgers University
- Doyle, Thomas W.**, Adjunct Assistant Professor, Agricultural & Environmental Sciences. BS, University of Louisiana at Monroe, 1976; MSc, 1980, PhD, 1983, University of Tennessee
- Dozier, James H.**, Adjunct Instructor, Agricultural & Environmental Sciences. BS, 1994, MS, 1997, Clemson University
- Drapcho, Cave M.**, Associate Professor, Environmental Engineering & Earth Sciences. BS, 1982, MS, 1986, Pennsylvania State University; PhD, Clemson University, 1993
- Dreau, Didier**, Adjunct Assistant Professor, Bioengineering. BS, University of Rennes I (France), 1988; MS, Blaise Pascal University (France), 1990; PhD, National College of Agriculture Rennes (France), 1994
- Duberstein, Jamie A.**, Research Assistant Professor, Belle W. Baruch Forest Science Institute. BS, University of Wisconsin-Stevens Point, 1998; MS, University of Florida, 2004; PhD, Clemson University, 2011
- Duchowski, Andrew T.**, Professor, School of Computing. BS, Simon Fraser University (Canada), 1990; PhD, Texas A&M University, 1997
- Duckett, Susan K.**, Ernest L. Corley Jr. Trustees Chair and Professor, Animal & Veterinary Sciences. BS, Iowa State University, 1989; MS, 1991, PhD, 1994, Oklahoma State University
- Duffy, Lauren N.**, Assistant Professor, Parks, Recreation & Tourism Management. BS, North Carolina State University, 2006; MS, University of North Carolina-Greensboro, 2009; PhD, Indiana University, 2013
- Duggan, Lisa M.**, Assistant Professor, School of Nursing. BS, 2000, MS, 2007, Clemson University; PhD, Clemson University, 2012
- Duke, John K.**, Adjunct Assistant Professor, Agricultural & Environmental Sciences. BS, University of Tennessee, 1987; MS, 2001, EdD, 2009, Clemson University
- Dumont, Richard G.**, Adjunct Professor, Sociology. PhD, University of Massachusetts-Amherst, 1968
- Dunn, Caroline**, Associate Professor, History. BA, University of Washington, 1997; MA, University of Durham (England), 1999; PhD, Fordham University, 2007
- Dunn, Heather W.**, Senior Lecturer, Animal & Veterinary Sciences. BS, 1998, PhD, 2004, Clemson University; MS, University of California-Davis, 2000
- Dunston, Pamela J.**, Associate Professor, Education & Human Development. BS, 1974, MA, 1978, Ball State University; PhD, University of Georgia, 1993
- Durham, Justin W.**, Director of Choral Activities, Performing Arts. BME, 1999, MME, 2002, Murray State University; DMA, Louisiana State University, 2010
- Dutkiewicz, Scott M.**, Associate Librarian, University Libraries. BA, San Diego State University, 1980; MLIS, University of Washington, 1990
- Dwyer, Gerald P., Jr.**, Visiting Professor and BB&T Scholar, Economics. BBA, University of Washington, 1969; MA, University of Tennessee, 1973; PhD, University of Chicago, 1979
- Dyckman, Caitlin**, Associate Professor, Planning, Development, & Preservation. BA, University of California-Los Angeles, 1997; JD, University of California-Davis, 2001; MCP, 2001, PhD, 2005, University of California
- Dye, Cheryl J.**, Professor, Public Health. BSE, 1977, MA, 1981, Northeast Missouri State University; PhD, University of South Carolina, 1991
- Dzuris, Linda**, Professor, Performing Arts; University Carillonneur. BM, 1992, MM, 1993, DMA, 1998, University of Michigan
- Eanes, Mehtap**, Adjunct Associate Professor, Chemistry. BS, Ege University (Turkey), 1994; MS, 1996, PhD, 2000, Clemson University
- Eatman, Megan E.**, Assistant Professor, English. BA, University of North Carolina-Greensboro, 2006; MA, 2009, PhD, 2013, University of Texas
- Eddy, Christina K.**, Adjunct Associate Professor, Animal & Veterinary Sciences. BA, Cornell College, 1982; PhD, Marquette University, 1987
- Edge, Sandy**, Director and Senior Lecturer, CBBS Undergraduate Advising Center. BS, Clemson University, 1972; MS, Troy University, 1980
- Edlein, Rebecca S.**, Lecturer, Graphic Communications. BS, Clemson University, 1991
- Edwards, Frances L.**, Associate Professor, School of Accountancy & Finance. BA, Graceland University, 1972; JD, University of Kansas, 1980
- Edwards, Kathy S.**, Associate Librarian, University Libraries. BA, 1978, MA, 1989, University of Texas; MSLIS, University of Illinois, 2006
- Edwards, Thomas B.**, Adjunct Professor, School of Materials Science & Engineering. BS, 1971, MS, 1973, PhD, 1979, Clemson University
- Eggert, Julia A.**, Professor, School of Nursing. BSN, University of Kansas, 1972; MN, Wichita State University, 1981; PhD, Clemson University, 1997
- Eichelberger, Adam C.**, Adjunct Assistant Professor, Animal & Veterinary Sciences. BS, Clemson University, 1999; DVM, University of Georgia, 2002
- Eidson, Gene W.**, Academic Program Director, Center for Applied Ecology; Professor, Biological Sciences. BS, University of South Carolina, 1972; MS, 1975, PhD, 1990, Clemson University

- Eksioglu, Burak**, Associate Professor, Industrial Engineering. BS, Bogazici University (Turkey), 1994; MS, University of Warwick (England), 1996; PhD, University of Florida, 2002
- Eksioglu, Sandra D.**, Associate Professor, Industrial Engineering. BS, University of Tirana (Albania), 1994; MS, Mediterranean Agronomic Institute of Chania (Greece), 1996; PhD, University of Florida, 2002
- El Salamouny, Said**, Adjunct Associate Professor, Agricultural & Environmental Sciences. BSc, 1986, MSc, 1991, PhD, 1998, Cairo University (Egypt)
- Ellis, Clifford D.**, Associate Professor, Planning, Development, & Preservation. BA, Colorado College, 1973; MPCD, University of Colorado-Denver, 1982; PhD, University of California, 1990
- Ellis, Steven E.**, Adjunct Associate Professor, Animal & Veterinary Sciences. BSc, University of Connecticut, 1992; MSc, 1994, PhD, 1998, Virginia Tech
- Engel, Annette S.**, Adjunct Associate Professor, Biological Sciences. BA, Wittenberg University, 1995; MS, University of Cincinnati, 1997; MS, University of Cincinnati, 1999; PhD, University of Texas, 2004
- Ennis, Robin P.**, Assistant Professor, Education & Human Development. BA, Birmingham-Southern College, 2005; MEd, Vanderbilt University, 2007; PhD, Georgia State University, 2013
- Erdogan, Ayse M.**, Visiting Assistant Professor, Economics. BA, 1999, MA, 2004, Bogazici University (Turkey); MA, 2008, PhD, 2009, University of Minnesota
- Ersoy, Ufuk**, Assistant Professor, School of Architecture. BArch, Dokuz Eylul University (Turkey), 1992; MArch, 1996, MS, 2002, PhD, 2008, University of Pennsylvania
- Ervin, Vincent J.**, Professor, Mathematical Sciences. BSc, Royal Melbourne Institute of Technology (Australia), 1978; MS, 1981, MS, 1983, PhD, 1984, Georgia Institute of Technology
- Esmailpoursaee, Amirreza**, Assistant Professor, Civil Engineering. BEng, University of Tehran (Iran), 1995; MAsc, 2004, PhD, 2007, University of Waterloo (Canada)
- Espey, Molly**, Professor, Economics. BS, 1988, MS, 1989, PhD, 1994, University of California-Davis
- Etheredge, Cady R.**, Adjunct Assistant Professor, Animal & Veterinary Sciences. BS, University of North Carolina-Asheville, 2005; PhD, Clemson University, 2013
- Evans, Larry W.**, Adjunct Associate Professor, Graphic Communications. BS, Rochester Institute of Technology, 1977
- Ewing, David J.**, Lecturer, General Engineering. BS, Pensacola Christian College, 2005; PhD, Clemson University, 2011
- Ewing, Nancy Ellen Rankin**, Lecturer, School of Nursing. BS, 1999, MS, 2003, Clemson University
- Fadel, Georges M.**, Exxon Mobil Endowed Chair and Professor, Mechanical Engineering. Diploma, Swiss Federal Institute of Technology (Switzerland), 1976; MSc, 1978, PhD, 1988, Georgia Institute of Technology
- Fain, Jillian L.**, Adjunct Assistant Professor, Animal & Veterinary Sciences. BSAG, 2003, MS, 2005, University of Georgia; PhD, Clemson University, 2012
- Falta, Deborah Alma**, Senior Lecturer, Public Health. BA, Franklin and Marshall College, 1987; MS, University of California, 1991; PhD, Clemson University, 2006
- Falta, Ronald W., Jr.**, Professor, Environmental Engineering & Earth Sciences. BS, 1982, MS, 1984, Auburn University; PhD, University of California, 1990
- Farahani, Hamid R Jalali**, Adjunct Associate Professor, Agricultural & Environmental Sciences. BS, Kansas State University, 1985; MS, University of Arizona, 1984; PhD, Colorado State University, 1991
- Farfan, Eduardo B.**, Adjunct Assistant Professor, Environmental Engineering & Earth Sciences. BS, Belarussian State University (Belarus), 1991; BS, 1997, ME, 1999, PhD, 2002, University of Florida
- Farmer, Jennie L.**, Assistant Professor, Education & Human Development. BA, 2001, MA, 2005, PhD, 2011, University of South Florida
- Farnham, Mark W.**, Adjunct Professor, Agricultural & Environmental Sciences. BS, Ohio State University, 1977; MS, North Carolina State University, 1984; PhD, University of Minnesota, 1988
- Farnworth, Edward G.**, Adjunct Professor, Agricultural & Environmental Sciences. BS, State University of New York-Stony Brook, 1962; MS, 1968, PhD, 1973, University of Florida
- Farris, John T.**, Associate Professor, Planning, Development, & Preservation. BA, Saint Louis University, 1972; MUP, 1974, PhD, 1996, Michigan State University; AICP, CRE
- Fasolino, Tracy K.**, Assistant Professor, School of Nursing. BS, Clemson University, 1997; MS, University of Texas Health Science Center-Houston, 2001; PhD, University of South Carolina, 2009
- Faust, James E.**, Associate Professor, Agricultural & Environmental Sciences. BS, Murray State College, 1986; MS, 1992, PhD, 1994, Michigan State University
- Feaster, Yvon H.**, Lecturer, School of Computing. BS, 2009, PhD, 2014, Clemson University
- Fecher, Daniel L.**, Lecturer, Communication Studies. BS, 2009, MS, 2012, Ball State University
- Federico, Lienne C.**, Professor, Teaching & Learning. BA, Hamilton College, 1981; MA, University of North Carolina, 1982; PhD, East Carolina University, 1996
- Feeser, Andrea V.**, Professor, Art. BA, Williams College, 1984; MPhil, 1992, PhD, 1996, City University of New York
- Felder, Frankie O.**, Associate Dean, Graduate School; Associate Professor, Teacher Education. BS, Virginia Commonwealth University, 1972; MEd, University of Vermont, 1974; MEd, 1984, EdD, 1986, Harvard University
- Feliciano, David M.**, Assistant Professor, Biological Sciences. BS, 2003, PhD, 2008, State University of New York-Buffalo
- Fellers, Gary P.**, Visiting Lecturer, Mathematical Sciences. BS, Clemson University, 1972; MBA, Florida Institute of Technology, 1976; PhD, Clemson University, 1983
- Feltus, Frank A.**, Associate Professor, Genetics & Biochemistry. BS, Auburn University, 1992; PhD, Vanderbilt University, 2000
- Fernando, Prithiviraj**, Adjunct Associate Professor, Biological Sciences. MB, BS, North Colombo Medical College (Sri Lanka), 1990; MSc, 1993, PhD, 1998, University of Oregon
- Ferrand, Yann**, Assistant Professor, Management. BS, 2005, MS, 2005, Toulouse Business School (France); MBA, 2007, MS, 2007, PhD, 2012, University of Cincinnati
- Ferrell, J. Lee**, BMW Senior Lecturer of German, Languages. BS, University of South Carolina-Upstate, 1986; MA, University of South Carolina, 2000
- Ferrell, William G., Jr.**, Professor, Industrial Engineering. BA, Wake Forest University, 1977; MS, Virginia Tech, 1979; PhD, North Carolina State University, 1989; PE
- Fery, Richard L.**, Adjunct Professor, Agricultural & Environmental Sciences. BS, Oregon State University, 1966; PhD, Purdue University, 1970
- Fessenden-Rahn, Julianna E.**, Adjunct Associate Professor, Environmental Engineering & Earth Sciences. BS, 1992, BA, 1993, PhD, University of California-San Diego, 1999
- Field, Jonathan B.**, Associate Professor, English. BA, Washington University, 1991; MA, 1993, PhD, 2004, University of Chicago
- Figliola, Richard S.**, Professor, Mechanical Engineering. BS, 1974, MS, 1976, PhD, 1979, University of Notre Dame; PE
- Filipi, Zoran**, Department Head and Professor, Automotive Engineering. BSE, 1980, MSE, 1987, PhD, 1992, University of Belgrade (Serbia)
- Fine, Amanda C.**, Senior Lecturer, Marketing. BA, Vanderbilt University, 2001; MBA, 2008, MS, 2008, Clemson University
- Fine, Jeffrey A.**, Associate Professor, Political Science. BA, Vanderbilt University, 2001; MA, 2004, PhD, 2006, University of Kentucky
- Finneran, Kevin T.**, Associate Professor, Environmental Engineering & Earth Sciences. BS, Rutgers University, 1996; PhD, University of Massachusetts-Amherst, 2001
- First, Patricia F.**, Distinguished Professor, Educational & Organizational Leadership Development. BS, University of Massachusetts-Amherst, 1965; MS, 1976, EdD, 1976, Illinois State University; JD, University of Dayton, 2001
- Fisk, Ashley C.**, Senior Lecturer, English. BS, 2000, MA, 2003, Clemson University
- Fitzmaurice, Stephen B.**, Assistant Professor, Languages. BA, University of South Carolina-Upstate, 2005; MIP, Northeastern University, 2009
- Fleck, Robert K.**, Professor, Economics. BA, University of California-San Diego, 1985; PhD, Stanford University, 1994
- Fleming, David S.**, Associate Professor, Teaching & Learning. BS, 1991, MEd, 1995, The Citadel; PhD, University of South Carolina, 1998
- Flite, Oscar P. III**, Adjunct Associate Professor, Biological Sciences. BS, State University of New York-Oswego, 1996; MS, Pennsylvania State University, 2000; PhD, Clemson University, 2006
- Flower, Phillip J.**, Associate Professor, Physics & Astronomy. BS, University of Toledo, 1970; PhD, University of Washington, 1976
- Flowers, Lamont A.**, Distinguished Professor, Educational and Organizational Leadership Development; Executive Director, Charles H. Houston Center for the Study of the Black Experience in Education. BS, Virginia Commonwealth University, 1996; MS, 1998, PhD, 2000, University of Iowa
- Foley, Ann C.**, Assistant Professor, Bioengineering. BA, University of Chicago, 1986; MA, 1994, MPhil, 1996, PhD, 2000, Columbia University
- Foltz, David C.**, Lecturer, English. BA, Erskine College, 2006; MA, Clemson University, 2009
- Fotheringham, Ulrich G.**, Adjunct Professor, School of Materials Science & Engineering. BS, 1987, PhD, 1990, University of Mainz (Germany)
- Foulger, Stephen H.**, Gregg-Graniteville Professor, School of Materials Science & Engineering. BS, University of California-Santa Barbara, 1990; PhD, Massachusetts Institute of Technology, 1996
- Foult, Jonn A.**, Adjunct Assistant Professor, Agricultural & Environmental Sciences. BS, 1992, MS, 1994, PhD, 1998, Clemson University
- Fraedrich, Bruce R.**, Adjunct Associate Professor, Agricultural & Environmental Sciences. BA, Newberry College, 1974; MF, Duke University, 1976; PhD, Clemson University, 1979
- Fralix, Brian H.**, Assistant Professor, Mathematical Sciences. BS, Clemson University, 2002; PhD, Georgia Institute of Technology, 2007
- Franco Santa Cruz, David**, Assistant Professor, School of Architecture. MArch, 2001, Diploma, 2010, Technical University of Madrid (Spain)
- Frankel, Bruce M.**, Adjunct Professor, Bioengineering. BA, Boston University, 1990; MD, State University of New York-Upstate Medical University, 1994
- Fraser, Angela M.**, Associate Professor, Food, Nutrition, & Packaging Sciences. BS, 1984, MS, 1987, PhD, 1995, Michigan State University
- Fravel, Philip M.**, Associate Professor, Agricultural & Environmental Sciences. BS, 1981, MS, 1997, PhD, 2004, Virginia Tech
- Fredendall, Lawrence D.**, Professor, Management. BS, Central Michigan University, 1972; MBA, 1986, PhD, 1991, Michigan State University
- Frederick, James R.**, Professor, Agricultural & Environmental Sciences. BS, 1981, MS, 1983, Pennsylvania State University; PhD, University of Illinois, 1987
- Freedman, David L.**, Department Head and Professor, Environmental Engineering & Earth Sciences. BS, University of Wisconsin, 1978; MS, University of Cincinnati, 1985; PhD, Cornell University, 1990
- Freeman, Yuri**, Adjunct Associate Professor, Electrical & Computer Engineering. MS, 1971, PhD, 1977, Kharkov Polytechnical Institute (Ukraine)
- Frost, Daniel H.**, Assistant Professor, Political Science. BA, Brigham Young University, 2007; MA, 2009, PhD, 2013, Princeton University
- Frugoli, Julia**, Professor, Genetics & Biochemistry. BS, Gordon College, 1988; PhD, Dartmouth College, 1998
- Fugate, Glenn A.**, Adjunct Assistant Professor, Environmental Engineering & Earth Sciences. BS, Tennessee Technological University, 1996; PhD, Florida State University, 2004
- Fullerton, Susan K.**, Associate Professor, Education & Human Development. BS, 1977, MEd, 1984, University of North Carolina-Greensboro; PhD, University of Maryland, 1991
- Futral, Meredith S.**, Associate Librarian, University Libraries. BS, University of West Alabama, 1995; MLIS, University of Southern Mississippi, 1997
- Gaillard, Jay B.**, Adjunct Assistant Professor, Environmental Engineering & Earth Sciences. BS, 2002, PhD, 2006, Clemson University; MS, Purdue University, 2006
- Gallagher, Colin M.**, Professor, Mathematical Sciences. BS, Sonoma State University, 1993; MS, 1994, PhD, 1998, University of California-Santa Barbara
- Gallagher, Eliza D.**, Lecturer, Mathematical Sciences. BS, 1992, MS, 1994, North Carolina State University

- Gallicchio, Vincent S.**, *Professor, Biological Sciences*. BA, 1970, MS, 1972, Southern Connecticut State University; MT, Yale University, 1971; PhD, New York University, 1976
- Gambrell, Linda B.**, *Professor, Education & Human Development*. BS, 1966, MEd, 1970, PhD, 1973, University of Maryland
- Gao, Chunhua**, *Adjunct Assistant Professor, Bioengineering*. BS, 1992, PhD, 1997, Xi'an Jiaotong University (China); PhD, Georgia Institute of Technology, 2007
- Gao, Xuhong**, *Professor, Mathematical Sciences*. BS, 1983, MS, 1990, Sichuan University (China); PhD, University of Waterloo (Canada), 1993
- Gao, Zhi**, *Associate Professor, Bioengineering*. BS, 1985, MS, 1988, Tianjin University (China); PhD, University of Miami, 1999
- Garnar, Andrew W.**, *Lecturer, Philosophy & Religion*. BA, Beloit College, 1996; MS, 1999, PhD, 2007, Virginia Tech
- Garrison, Arthur W.**, *Adjunct Professor, Environmental Engineering & Earth Sciences*. BS, The Citadel, 1956; MS, Clemson University, 1958; PhD, Emory University, 1966
- Garst, Barry A.**, *Associate Professor, Youth Development Programs*. BS, Virginia Tech, 1993; MS, Arizona State University, 1998; PhD, Virginia Tech, 2005
- Gasic, Ksenija**, *Associate Professor, Agricultural & Environmental Sciences*. BS, 1989, MS, 1993, PhD, 1999, University of Novi Sad (Serbia)
- Gaubert, James G.**, *Senior Lecturer, Marketing*. BS, 1982, MBA, 1984, Nicholls State University
- Geiculescu, Olt E.**, *Lecturer, Chemistry*. BS, 1981, PhD, 2000, Polytechnic University of Bucharest (Romania); MS, 1996, PhD, 2004, Clemson University
- Geist, Robert M., III**, *Professor, School of Computing*. BA, 1970, MA, 1980, Duke University; MS, 1973, PhD, 1974, University of Notre Dame
- Gelhaus, Jon K.**, *Adjunct Associate Professor, Agricultural & Environmental Sciences*. BS, University of California-Davis, 1978; MA, 1983, PhD, 1989, University of Kansas
- Gerard, Patrick D.**, *Professor, Mathematical Sciences*. BS, University of Louisiana at Lafayette, 1979; MS, Virginia Tech, 1981; PhD, Southern Methodist University, 1993
- Gering, Lawrence R.**, *Associate Professor, Forestry & Environmental Conservation*. BS, University of Maine, 1979; MS, Clemson University, 1982; PhD, University of Georgia, 1985
- Getman, Rachel B.**, *Assistant Professor, Chemical & Biomolecular Engineering*. BS, Michigan Technological University, 2004; PhD, University of Notre Dame, 2009
- Gevaert, Matthew R.**, *Adjunct Assistant Professor, Bioengineering*. BS, University of Waterloo (Canada), 1995; MS, 1999, PhD, 2003, Clemson University
- Gianiodis, Peter T.**, *Associate Professor, Management*. BA, Dickinson College, 1993; MBA, Queens University of Charlotte, 2001; PhD, University of Georgia, 2006
- Gibert, James M.**, *Adjunct Assistant Professor, Civil Engineering*. BS, 2001, MS, 2004, PhD, 2009, Clemson University
- Gibson, Philip G.**, *Adjunct Assistant Professor, Agricultural & Environmental Sciences*. BS, Oklahoma State University, 1982; MS, University of Georgia, 1984; PhD, Clemson University, 2000
- Gill, Sanjitpal S.**, *Adjunct Assistant Professor, Bioengineering*. BA, 1994, MD, 1998, Boston University
- Gillespie, Jackie S.**, *Senior Lecturer, School of Nursing*. BS, Clemson University, 1975; MN, University of South Carolina, 1979
- Gimbel, Ronald W.**, *Department Head and Associate Professor, Public Health*. MA, Webster University, 1990; BS, 1989, PhD, 2005, State University of New York-Albany
- Glaser, Marianne H.**, *Senior Lecturer, Communication Studies*. BS, 1999, MA, 2002, Clemson University
- Gloy, Yves-Simon**, *Adjunct Professor, School of Materials Science & Engineering*. BS, 2008, PhD, 2012, RWTH Aachen University (Germany)
- Goddard, Wayne D.**, *Associate Professor, School of Computing*. BS, 1985, BS, 1986, PhD, 1989, University of Natal-Dunbar (South Africa); PhD, Massachusetts Institute of Technology, 1992
- Godfrey, Michael G.**, *Lecturer, Educational & Organizational Leadership Development*. BS, College of Charleston, 1998; MS, James Madison University, 2001; PhD, Clemson University, 2010
- Goforth, Reuben R.**, *Adjunct Assistant Professor, Forestry & Environmental Conservation*. BS, 1992, MS, 1994, Clemson University; PhD, Cornell University, 1999
- Goldsmith, Edie C.**, *Adjunct Associate Professor, Bioengineering*. BS, College of Charleston, 1990; PhD, University of North Carolina, 1996
- Gomes, Roger**, *Associate Professor, Marketing*. BSME, University of Massachusetts, 1972; MBA, Bryant University, 1977; PhD, Virginia Tech, 1988
- Gomez-Chiarri, Marta**, *Adjunct Professor, Biological Sciences*. BS, 1988, PhD, 1992, Universidad Complutense-Madrid (Spain)
- Goodstein, Richard E.**, *Dean, College of Architecture, Arts & Humanities; Professor, Performing Arts*. BM, Miami University, 1975; MM, 1981, PhD, 1984, Arizona State University
- Goss, Erin M.**, *Associate Professor, English*. AB, Washington University, 1998; PhD, Emory University, 2005
- Gourdie, Robert G.**, *Adjunct Professor, Bioengineering*. BSc, 1981, MSc, 1983, University of Auckland (New Zealand); PhD, University of Canterbury (New Zealand), 1989
- Gowdy, John N.**, *Professor, Electrical & Computer Engineering*. BS, Massachusetts Institute of Technology, 1967; MS, 1968, PhD, 1971, University of Missouri
- Gramopadhye, Anand K.**, *Dean, College of Engineering & Science; Professor, Industrial Engineering*. BE, Veermata Jijabai Technological Institute (India), 1987; MS, 1989, PhD, 1992, State University of New York-Buffalo
- Granberg, Ellen M.**, *Department Head, Sociology and Anthropology; Associate Professor, Sociology*. BA, University of California-Davis, 1984; MA, 1997, PhD, 2001, Vanderbilt University
- Grant, Anne M.**, *Associate Librarian, University Libraries*. BA, Western Carolina University, 1997; PGD, University of Aberdeen (Scotland), 1999; MA, Clemson University, 2001; MLIS, University of Alabama, 2007
- Grant, H. Roger**, *Kathryn and Calhoun Lemon Professor, History*. BA, 1966, LHD, 2003, Simpson College; MA, 1967, PhD, 1970, University of Missouri
- Grau, Christopher M.**, *Associate Professor, Philosophy & Religion*. BA, New York University, 1992; MA, 2001, PhD, 2002, Johns Hopkins University
- Gray, Bruce H.**, *Adjunct Professor, Bioengineering*. BA, College of Wooster, 1979; MS, Ohio State University, 1982; DO, Ohio University, 1986
- Green, Keith E.**, *Professor, School of Architecture*. BA, University of Pennsylvania, 1985; MArch, University of Illinois, 1990; MS, 1993, PhD, 1998, University of Pennsylvania
- Green, Timothy F.**, *Assistant Professor, Planning, Development, & Preservation*. BA, Cornell University, 1998; MUP, University of Illinois, 2008
- Greene, Annel K.**, *Professor, Animal & Veterinary Sciences*. BS, 1982, MS, 1985, Louisiana State University; PhD, Mississippi State University, 1988
- Greene, Daniel T.**, *Assistant Professor, School of Accountancy & Finance*. BBA, University of Georgia, 2004; PhD, Georgia State University, 2014
- Greene, Jeremy K.**, *Professor, Agricultural & Environmental Sciences*. BA, College of Charleston, 1991; MS, 1995, PhD, 1998, Clemson University
- Greene, John L.**, *Adjunct Professor, Forestry & Environmental Conservation*. BS, University of Maryland, 1970; MSF, 1976, PhD, 1978, West Virginia University
- Greene, Walter D.**, *Adjunct Professor, Forestry & Environmental Conservation*. BS, Louisiana State University, 1981; MS, Virginia Tech, 1983; PhD, Auburn University, 1986
- Greenstein, Joel S.**, *Associate Professor, Industrial Engineering*. MS, Stanford University, 1974; BS, 1973, PhD, 1979, University of Illinois
- Grest, Gary S.**, *Adjunct Professor, Chemistry*. BS, 1971, MS, 1973, PhD, 1974, Louisiana State University
- Griffin, Sarah F.**, *Associate Professor, Public Health*. BS, Winthrop University, 1988; MPH, 1993, PhD, 2001, University of South Carolina
- Grigg, Sarah J.**, *Lecturer, General Engineering*. BS, 2007, MS, 2008, MBA, 2012, PhD, 2012, Clemson University
- Groff, Richard E.**, *Associate Professor, Electrical & Computer Engineering*. BS, 1996, BS, 1996, Pennsylvania State University; MS, 1998, PhD, 2003, University of Michigan
- Grosby, Steven E.**, *Professor, Philosophy & Religion*. BA, Brandeis University, 1983; PhD, University of Chicago, 1989
- Grove, Stephen J.**, *Professor, Marketing*. BA, 1972, MA, 1975, Texas Christian University; PhD, Oklahoma State University, 1979
- Grover, Varun**, *William S. Lee Distinguished Professor of Information Systems, Management*. BTech, Indian Institute of Technology (India), 1982; MBA, Southern Illinois University, 1985; PhD, University of Pittsburgh, 1990
- Grubb, C. Alan**, *Associate Professor, History*. BA, Washington and Lee University, 1963; MA, 1964, PhD, 1969, Columbia University
- Grujicic, Mica**, *Wilfred P. and Helen S. Tiencken Professor, Mechanical Engineering*. BEng, 1975, MEng, 1978, University of Belgrade (Serbia); PhD, Massachusetts Institute of Technology, 1983
- Guest, Allen A.**, *Senior Lecturer, Mathematical Sciences*. MBA, Virginia Commonwealth University, 1985; BS, 1982, MS, 1998, Clemson University
- Guffey, Daryl M.**, *Professor, School of Accountancy & Finance*. BS, 1971, MA, 1972, Appalachian State University; BS, University of South Carolina-Upstate, 1982; PhD, University of South Carolina, 1989; CPA (North Carolina), CIA, CMA
- Gugerty, Leo J.**, *Professor, Psychology*. BA, State University of New York-Buffalo, 1975; PhD, University of Michigan, 1989
- Guisseppi-Elie, Annette**, *Adjunct Associate Professor, Environmental Engineering & Earth Sciences*. BS, 1977, MS, 1979, University of the West Indies (West Indies); MS, University of Manchester Institute of Science and Technology (England), 1980; PhD, University of Maryland, 1987
- Guisseppi-Elie, Anthony**, *Professor, Chemical & Biomolecular Engineering*. BS, University of The West Indies-Mona (Jamaica), 1979; MS, University of Manchester Institute of Science and Technology (England), 1980; SC.D., Massachusetts Institute of Technology, 1983
- Gulde, Cynthia M.**, *Adjunct Assistant Professor, Environmental Engineering & Earth Sciences*. BS, Texas A&M University, 1993; MS, University of Houston-Clear Lake, 1997; PhD, Clemson University, 2002
- Gupte, Akshay S.**, *Assistant Professor, Mathematical Sciences*. BE, University of Mumbai (India), 2005; MS, University of Arizona, 2007; PhD, Georgia Institute of Technology, 2012
- Haemmerich, Dieter**, *Adjunct Assistant Professor, Bioengineering*. MS, 1998, PhD, 2003, Vienna University of Technology (Austria); MS, 2000, PhD, 2001, University of Wisconsin
- Hagan, Donald L.**, *Lecturer, Forestry & Environmental Conservation*. BS, University of West Florida, 2002; MS, 2008, PhD, 2012, University of Florida
- Hains, John J., Jr.**, *Associate Professor, Biological Sciences*. BS, North Carolina State University, 1971; MS, 1981, PhD, 1987, Clemson University
- Hajdu, Zoltan**, *Research Assistant Professor, Bioengineering*. MD, University of Medicine and Pharmacy of Targu Mures (Romania), 2004
- Haley-Zitlin, Vivian J.**, *Associate Professor, Food, Nutrition, & Packaging Sciences*. BS, University of Kentucky, 1977; PhD, University of Tennessee, 1991
- Halfacre, Robert G.**, *University Ombudsman; Alumni Distinguished Professor, Agricultural & Environmental Sciences*. BS, 1963, MS, 1965, Clemson University; PhD, Virginia Tech, 1968; MLA, North Carolina State University, 1973
- Halford, Jonathan J.**, *Adjunct Associate Professor, School of Computing; Adjunct Associate Professor, Electrical & Computer Engineering*. BA, Duke University, 1990; MD, Medical University of South Carolina, 1996
- Hall, Anna H.**, *Assistant Professor, Teaching & Learning*. BS, 1998, MEd, 1999, Auburn University; PhD, University of Kentucky, 2012
- Hall, Karen C.**, *Adjunct Assistant Professor, Forestry & Environmental Conservation*. BS, Western Carolina University, 1996; MS, 1999, PhD, 2006, Clemson University
- Haller, William J.**, *Associate Professor, Sociology*. BA, Hamline University, 1986; MA, 1994, PhD, 1999, University of Pittsburgh
- Hallo, Jeffrey C.**, *Associate Professor, Parks, Recreation & Tourism Management*. BS, Frostburg State University, 1998; MS, Johns Hopkins University, 2001; PhD, University of Vermont, 2007
- Haltiwanger, Corrie L.**, *Lecturer, Teacher Education*. BS, Clemson University, 1997; MA, The Citadel, 2002
- Hambright-Belue, Sallie R.**, *Assistant Professor, School of Architecture*. BS, Clemson University, 2002; MArch, Yale University, 2007
- Han, Young J.**, *Professor, Agricultural & Environmental Sciences*. BS, 1979, MS, 1981, Seoul National University (Korea); PhD, University of Illinois, 1986; PE

- Haney, Harry L. Jr.**, *Adjunct Professor, Forestry & Environmental Conservation*. BS, Auburn University, 1959; MF, 1969, MPH, 1971, MS, 1973, PhD, 1975, Yale University
- Hankins, Gabriel A.**, *Assistant Professor, English*. BA, Swarthmore College, 2003; MA, 2008, PhD, 2013, University of Virginia
- Hanks, Timothy W.**, *Adjunct Associate Professor, Chemistry*. BS, South Dakota School of Mines and Technology, 1982; PhD, Montana State University, 1986
- Hanlin, Hugh G.**, *Adjunct Associate Professor, Forestry & Environmental Conservation*. BS, 1972, MS, 1975, Auburn University; PhD, Oregon State University, 1980
- Hanna, Jennifer M.**, *Senior Lecturer, Mathematical Sciences*. BS, State University of New York-Fredonia, 1997; MS, Clemson University, 1999
- Hanna, Marion L., Jr.**, *Senior Lecturer, Mathematical Sciences*. BS, 1994, MS, 1996, Clemson University
- Hannen, Michael H.**, *Lecturer, Philosophy & Religion*. BA, California State University-Fresno, 1990; MA, Northern Illinois University, 1995; MA, University of California-Santa Barbara, 2005
- Hanssen, Frederick A.**, *Professor, Economics*. BA, 1980, MA, 1981, Johns Hopkins University; MBA, 1995, PhD, 1995, University of Chicago
- Harcum, Sarah W.**, *Professor, Bioengineering*. BS, University of Michigan, 1986; MS, Colorado State University, 1988; PhD, University of Maryland, 1993
- Harding, Daniel N.**, *Associate Professor, School of Architecture*. BA, University of North Carolina-Charlotte, 1992; MArch, Clemson University, 1994
- Hardwick, Renea C.**, *Senior Lecturer, Biological Sciences*. BS, 1994, MA, 1997, University of Colorado-Denver
- Hargett, David L.**, *Adjunct Associate Professor, Agricultural & Environmental Sciences*. BS, 1976, MS, 1979, North Carolina State University; PhD, University of Wisconsin, 1983
- Harman, Melinda K.**, *Assistant Professor, Bioengineering*. BS, Ball State University, 1990; MS, University of Utah, 1992; PhD, Clemson University, 2007
- Harp, Nancy L.**, *Assistant Professor, School of Accountancy & Finance*. BS, Ball State University, 2003; PhD, Texas Tech University, 2012
- Harrell, William R.**, *Associate Professor, Electrical & Computer Engineering*. BS, 1981, MS, 1983, University of Kentucky; PhD, University of Maryland, 1994
- Harris, John M.**, *Adjunct Assistant Professor, Industrial Engineering*. BA, Gustavus Adolphus College, 1992; MS, University of Oxford (England), 1996; PhD, Clemson University, 1999
- Harris, Scott K.**, *Senior Lecturer, Languages*. BA, 1980, MAT, 1985, University of South Carolina
- Hartmann, David J.**, *Department Head and Professor, Performing Arts*. BFA, University of Wisconsin-Whitewater, 1982; MFA, University of Minnesota, 1986
- Hartmann, Dieter H.**, *Professor, Physics & Astronomy*. BA, 1982, MA, 1982, University of Göttingen (Germany); PhD, University of California-Santa Cruz, 1989
- Hartsock, Langdon A.**, *Adjunct Associate Professor, Biomechanics; Associate Professor and Chair, Orthopedic Surgery, Medical University of South Carolina*. BS, Davidson College, 1983; MD, Duke University, 1987
- Hassell, Richard L.**, *Professor, Agricultural & Environmental Sciences*. BS, Brigham Young University, 1977; MS, Cornell University, 1979; PhD, Ohio State University, 1993
- Havice, Pamela A.**, *Professor, Leadership, Educational & Organizational Leadership Development*. BS, 1980, MS, 1984, Fort Hays State University; PhD, Clemson University, 1999
- Havice, William L.**, *Associate Dean for Academic Support Services & Undergraduate Studies, College of Health, Education, & Human Development; Professor, Education & Organizational Leadership Development*. BS, 1977, MS, 1979, Fort Hays State University; EdS, Pittsburg State University, 1984; PhD, Kansas State University, 1994
- Hawkins, Brent L.**, *Assistant Professor, Parks, Recreation & Tourism Management*. BS, 2006, MS, 2009, East Carolina University; PhD, Clemson University, 2013
- Hawkins, Richard J.**, *Adjunct Professor, Bioengineering*. BA, 1965, MD, 1969, University of Western Ontario (Canada)
- Haynes, Cynthia A.**, *Associate Professor, English*. BA, 1974, MA, 1990, PhD, 1994, University of Texas-Arlington
- Hayter, Earl J.**, *Adjunct Associate Professor, Civil Engineering*. BS, Florida Institute of Technology, 1976; MS, 1979, PhD, 1983, University of Florida
- Hazlett, Thomas W.**, *Endowed Chair, Economics*. PhD, University of California-Los Angeles, 1984
- He, Jian**, *Associate Professor, Physics & Astronomy*. BS, Jilin University (China), 1991; PhD, University of Tennessee-Chattanooga, 2004
- He, Yuhong**, *Assistant Professor, Management*. BA, Jilin University (China), 2006; MS, Peoples University of China (China), 2008; PhD, University of California-Irvine, 2014
- Headley, Kathy N.**, *Associate Dean for Research & Graduate Programs, College of Health, Education, & Human Development; Professor, Education & Human Development*. BSEd, 1974, MEd, 1976, University of Georgia; EdD, Auburn University, 1987
- Hebert, Renee J.**, *Lecturer, Office of Student Enrichment*. BA, 1998, MEd, 2000, University of Louisiana at Monroe
- Hecker, Douglas A.**, *Associate Professor, School of Architecture*. BA, University of Florida, 1990; MArch, Columbia University, 1994
- Hedetniemi, Sandra M.**, *Professor, School of Computing*. BA, Centre College, 1971; MS, 1973, PhD, 1977, University of Virginia
- Heine, Ulrike Ann-Sophie**, *Associate Professor, School of Architecture*. BArch, 1994, Dipl.Ing. (MS) Arch, 1999, Brandenburg Technical University (Germany)
- Heister, Timo J.**, *Assistant Professor, Mathematical Sciences*. Dipl. 2008, PhD, 2011, University of Göttingen (Germany)
- Helm, Julie D.**, *Lecturer, Animal Health Programs; Adjunct Professor, Animal & Veterinary Sciences*. BS, 1992, DVM, 1995, Oregon State University
- Heniford, B Todd**, *Adjunct Assistant Professor, Bioengineering*. BS, Clemson University, 1985; MD, Medical University of South Carolina, 1989
- Hennig, Mirko**, *Adjunct Associate Professor, Chemistry*. Diploma, 1995, PhD, 1999, Goethe University Frankfurt (Germany)
- Henson, John M.**, *Research Associate Professor, Biological Sciences*. BS, University of South Carolina, 1975; MS, Clemson University, 1978; PhD, University of Florida, 1983
- Hernandez, Filiberto M.**, *Senior Lecturer, Languages*. BA, 2001, MA, 2003, PhD, 2006, University of California-Riverside
- Herro, Danielle C.**, *Assistant Professor, Education & Human Development*. BS, 1989, MS, 1997, University of Wisconsin-Milwaukee; PhD, University of Wisconsin, 2010
- Hewitt, Robert R.**, *Associate Professor, Landscape Architecture*. BA, 1976, BSLA, 1993, University of California-Davis; MCP, 1996, MLA, 1996, University of California
- Hickman, Thomas D.**, *Lecturer, Chemistry*. BS, University of North Carolina-Asheville, 2001; PhD, Clemson University, 2009
- Higdon, Homer L., III**, *Adjunct Associate Professor, Animal & Veterinary Sciences; Adjunct Associate Professor, Mathematical Sciences*. BS, 1988, MS, 1995, Angelo State University; PhD, Clemson University, 1999
- Hill, Gary M.**, *Adjunct Professor, Animal & Veterinary Sciences*. BS, Clemson University, 1969; MS, 1974, PhD, 1977, University of Kentucky
- Hill, Gerald R.**, *Adjunct Professor, Environmental Engineering & Earth Sciences*. BS, 1971, MS, 1974, PhD, 1979, University of Iowa
- Hinz, Elizabeth A.**, *Lecturer, Clinical Education & Practice, Joseph F. Sullivan Center*. MS, Clemson University, 2008
- Hiott, Elaine H.**, *Lecturer, Education & Human Development*. BA, University of South Carolina, 1985; MEd, Clemson University, 1992
- Hiott, William D.**, *Director, Historic Properties; Adjunct Instructor, History*. BA, 1983, MA, 1986, University of South Carolina
- Hirt, Douglas E.**, *Department Head and Professor, Chemical & Biomolecular Engineering*. BS, 1982, MS, 1984, Virginia Tech; PhD, Princeton University, 1989
- Hitchcock, Daniel R.**, *Associate Professor, Agricultural & Environmental Sciences*. BS, University of Tennessee, 1993; MS, 1996, PhD, 2001, University of Georgia
- Hochrine, Catherine A.**, *Senior Lecturer, School of Computing*. BA, East Stroudsburg University of Pennsylvania, 1990; MS, Clemson University, 2002
- Hodge, Martha J.**, *Associate Professor, Education & Human Development*. BS, Memphis State University, 1976; MA, University of North Alabama, 1983; PhD, Vanderbilt University, 1995
- Hodges, Larry F.**, *Professor, School of Computing*. BA, Elon University, 1974; MA, Lancaster Theological Seminary, 1978; MS, 1982, PhD, 1988, North Carolina State University
- Hoffman, Mark A.**, *Research Assistant Professor, Automotive Engineering*. BS, Union College-Schenectady, 2003; MSE, 2008, PhD, 2012, University of Michigan
- Hoffman, Wesley P.**, *Adjunct Professor, Chemical & Biomolecular Engineering*. BS, Houghton College, 1969; PhD, Pennsylvania State University, 1977
- Holder, Sharon M.**, *Research Assistant Professor, Public Health*. BS, University of Houston-Downtown, 1991; MSW, University of Houston, 1993; MS, University of London (England), 2004; PhD, University of Southampton (England), 2011
- Holland, Jennifer C.**, *Senior Lecturer, Sociology and Anthropology*. BA, Clemson University, 2002; MSW, University of South Carolina, 2004
- Holland, Martin J.**, *Assistant Professor, Landscape Architecture*. BA, Dalhousie University (Canada), 1993; MLArch, University of Virginia, 2002; PhD, University of Illinois, 2014
- Hollandsworth, Robert L.**, *Associate Librarian, University Libraries*. BS, Appalachian State University, 1990; MLIS, University of North Carolina-Greensboro, 1994; MS, Westminster College, 2006
- Hollingsworth, Carl W.**, *Associate Professor, School of Accountancy & Finance*. BBA, 1997, MSA, 1997, Texas Tech University; PhD, University of Tennessee, 2007; CPA (Texas)
- Holmevik, Jan R.**, *Associate Professor, English*. BA, 1991, MA, 1994, University of Trondheim (Norway); PhD, University of Bergen (Norway), 2004
- Homyack, Jessica A.**, *Adjunct Assistant Professor, Forestry & Environmental Conservation*. BS, West Virginia University, 1999; MS, University of Maine, 2003; PhD, Virginia Tech, 2009
- Hoover, Adam W.**, *Associate Professor, Electrical & Computer Engineering*. BS, 1992, MS, 1993, PhD, 1996, University of South Florida
- Hopkins, Christopher D.**, *Associate Professor, Marketing*. BS, Concord College, 1987; MBA, Radford University, 1995; PhD, Mississippi State University, 2001
- Hopkins, John E., III**, *Lecturer, Management*. BA, 1973, MA, 1974, University of Notre Dame; MBA, University of Rhode Island, 1977
- Horton, Dan L.**, *Adjunct Professor, Agricultural & Environmental Sciences*. BS, 1973, MS, 1978, Clemson University; PhD, University of Arkansas, 1982
- Hoskins, Clyde B.**, *Lecturer, Animal Health Programs, Adjunct Assistant Professor, Animal & Veterinary Sciences*. BS, United States Military Academy, 1971; DVM, 1981, MS, 1987, University of Tennessee
- Hosler, Ned M.**, *Associate Professor, Performing Arts*. BMed, 1976, MA, 1985, PhD, 1992, Ohio State University
- Houjeiry, Tania I.**, *Lecturer, Chemistry*. BS, Lebanese University (Lebanon), 2003; MS, American University of Beirut (Lebanon), 2007; PhD, Florida State University, 2012
- House, Donald H.**, *Division Chair and Professor of Computational Arts and Visual Computing, School of Computing*. BS, Union College, 1969; MS, Rensselaer Polytechnic Institute, 1978; PhD, University of Massachusetts-Amherst, 1984
- Howard, Lance F.**, *Senior Lecturer, History*. BS, University of Michigan, 1972; MS, University of California-Riverside, 1986; PhD, University of California-Los Angeles, 1994
- Howard, Tharon W.**, *Professor, English*. BA, University of Missouri, 1985; MA, 1987, PhD, 1992, Purdue University
- Howle, David S.**, *Adjunct Assistant Professor, Agricultural & Environmental Sciences*. BS, 1975, MS, 1980, Clemson University; PhD, University of Arkansas, 1984
- Hoyt, Greg D.**, *Adjunct Professor, Agricultural & Environmental Sciences*. BS, Kent State University, 1972; MS, Ohio State University, 1975; PhD, University of Georgia, 1981
- Hsia, Tain-Yen**, *Adjunct Assistant Professor, Mechanical Engineering*. BS, 1989, MS, 1991, Massachusetts Institute of Technology; MD, Stanford University, 1996
- Hu, Hongxin**, *Assistant Professor, School of Computing*. BS, 1997, MS, 2002, China University of Geosciences (China); PhD, Arizona State University, 2012
- Hu, Xiaobo**, *Professor, Political Science*. BA, Institute of International Relations (China), 1984; LLM, Peking University (China), 1986; PhD, Duke University, 1994
- Huang, Yong**, *Adjunct Professor, Mechanical Engineering*. BS, Xidian University (China), 1993; MS, Zhejiang University (China), 1996; MS, University of Alabama, 1999; MS, 2002, PhD, 2002, Georgia Institute of Technology
- Huang, Yongxi**, *Assistant Professor, Civil Engineering*. BE, Huazhong University of Science and Technology (China), 2003; ME, National University of Singapore (Singapore), 2005; PhD, University of California-Davis, 2010

- Hubbard, Stephen J.**, *Visiting Associate Professor, Electrical & Computer Engineering*. BS, Clemson University, 1985; MS, University of Wisconsin, 1986; PhD, Georgia Institute of Technology, 1994
- Huda, Walter**, *Adjunct Professor, Bioengineering*. BA, University of Oxford (England), 1973; PhD, Royal Postgraduate Medical School, University of London (England), 1979
- Huddleston, George M., III**, *Adjunct Assistant Professor, Forestry & Environmental Conservation*. BS, 1989, MS, 1994, Eastern Kentucky University; PhD, Clemson University, 2001
- Hudgins, Carter L.**, *Professor, Planning, Development, & Preservation*. BA, University of Richmond, 1971; MA, Wake Forest University, 1972; PhD, College of William and Mary, 1984
- Huebner, Christopher F.**, *Research Assistant Professor, School of Materials Science & Engineering*. BS, Shippensburg University of Pennsylvania, 2003; PhD, Clemson University, 2009
- Huff, Raymond T.**, *Associate Professor, School of Architecture*. BArch, Clemson University, 1971; FAIA
- Hughes, Thomas A.**, *Professor, Biological Sciences*. BS, South Carolina State University, 1975; MS, 1978, PhD, 1981, North Carolina State University
- Hull, Richard J.**, *Adjunct Professor, Agricultural & Environmental Sciences*. BS, 1957, MS, 1959, University of Rhode Island; PhD, University of California-Davis, 1964
- Hung, Christina N.**, *Associate Professor, Art*. BFA, Atlanta College of Art, 1997; MFA, Carnegie Mellon University, 1997
- Hunter, Gary K.**, *Associate Professor, Marketing*. BS, United States Military Academy, 1985; MBA, University of Tennessee, 1993; PhD, University of North Carolina, 1999
- Hunter, Walter E., IV**, *Assistant Professor, English*. AB, Harvard University, 2004; PhD, University of Virginia, 2013
- Hurlburt, Timothy R.**, *Lecturer, Performing Arts*. BM, Michigan State University, 2003; MM, Texas State University-San Marcos, 2008
- Hurley, Rupert A.**, *Assistant Professor, Food, Nutrition, & Packaging Sciences*. BS, 2006, MS, 2008, PhD, 2011, Clemson University
- Husson, Scott M.**, *Professor, Chemical & Biomolecular Engineering*. BS, Pennsylvania State University, 1993; PhD, University of California, 1998
- Hutcheon, Deborah A.**, *Lecturer, Food, Nutrition, & Packaging Sciences*. BS, Bob Jones University, 2006; MS, Eastern Michigan University, 2010
- Hutchison, Randolph E.**, *Adjunct Assistant Professor, Bioengineering*. BS, Virginia Tech, 1999; MS, 2011, PhD, 2011, Clemson University
- Hwu, Shiou-jyh**, *Professor, Chemistry*. BS, Fu Jen Catholic University (China), 1978; MS, Western Michigan University, 1979; PhD, Iowa State University, 1985
- Ickes, Kalan L.**, *Assistant Professor, Biological Sciences*. BA, Swarthmore College, 1992; PhD, Louisiana State University, 2001; MBA, University of Pittsburgh, 2003
- Imm, Donald W.**, *Adjunct Associate Professor, Forestry & Environmental Conservation*. BS, State University of New York-Fredonia, 1985; PhD, State University of New York-Fredonia, 1990
- Ingle, Jennifer F.**, *Lecturer, Philosophy & Religion*. BA/BS, Purdue University, 1996; MA, 2002, PhD, 2007, University of South Florida
- Ingram, Amy E.**, *Assistant Professor, Management*. BBA, 2004, MBA, 2005, PhD, 2010, University of Cincinnati
- Ingram, Samuel T.**, *Department Head and Professor, Graphic Communications*. BS, Appalachian State University, 1978; MInEd, 1982, EdD, 1985, Clemson University
- Ingram-Smith, Cheryl J.**, *Assistant Professor, Genetics & Biochemistry*. BS, Massachusetts Institute of Technology, 1986; PhD, University of Pennsylvania School of Medicine, 1996
- Intintoli, Vincent J.**, *Visiting Assistant Professor, School of Accountancy & Finance*. BS, 2001, MS, 2002, PhD, 2007, University of Arizona
- Irving II, James H.**, *Assistant Professor, School of Accountancy & Finance*. BS, 1997, MS, 2001, University of Virginia; PhD, University of North Carolina, 2006
- Isenburg, Jason C.**, *Adjunct Assistant Professor, Bioengineering*. BS, Rose-Hulman Institute of Technology, 2002; PhD, Clemson University, 2006
- Isengildina, Olga Urjevna**, *Adjunct Associate Professor, Agricultural & Environmental Sciences*. BA, Tashkent State University (Uzbekistan), 1993; MS, 1996, PhD, 2000, Mississippi State University
- Ivanco, Andrej**, *Research Assistant Professor, Automotive Engineering*. MS, 2006, PhD, 2009, Czech Technical University in Prague (Czech Republic); PhD, University of Orleans (France), 2009
- Jachowski, David S.**, *Assistant Professor, Forestry & Environmental Conservation*. BS, University of Montana-Missoula College of Technology, 1999; MS, 2007, PhD, 2012, University of Missouri-Columbia
- Jackson, Debra B.**, *Assistant to the President/Associate Provost for Institutional Effectiveness & Assessment, Assessment; Professor, Public Health Sciences*. BSN, Medical University of South Carolina, 1971; MN, Emory University, 1975; PhD, Georgia State University, 1983
- Jacobs, John J.**, *Lecturer, Graphic Communications*. BS, 1991, MS, 2010, Clemson University
- Jacobsohn, Luiz G.**, *Assistant Professor, School of Materials Science & Engineering*. BS, 1992, MS, 1994, PhD, 1999, Pontifical Catholic University of Rio de Janeiro (Brazil)
- Jahn, Judson R.**, *Senior Lecturer, School of Accountancy & Finance*. BS, Limestone College, 1991; MBA, Clemson University, 1998; JD, Mercer University, 1994; LLM, University of Alabama, 2012
- Jakymiw, Andrew G.**, *Adjunct Assistant Professor, Bioengineering*. BSc, 1996, PhD, 2002, University of Calgary (Canada)
- James, Joseph B.**, *Adjunct Assistant Professor, Agricultural & Environmental Sciences*. BS, Wofford College, 1968; MD, Wake Forest University, 1972
- James, Kevin L.**, *Professor, Mathematical Sciences*. BS, 1991, PhD, 1997, University of Georgia
- Jamil, Faiza M.**, *Assistant Professor, Education & Human Development*. BA, Bryn Mawr College, 1999; MEd, College of New Jersey, 2005; PhD, University of Virginia, 2013
- Jayakaran, Anand D.**, *Associate Professor, Agricultural & Environmental Sciences*. BE, Bangalore University (India), 1997; MS, 2002, PhD, 2006, Ohio State University
- Jeffers, Steven N.**, *Professor, Agricultural & Environmental Sciences*. BS, University of California-Davis, 1976; MS, 1980, PhD, 1985, Cornell University
- Jeffries, James B.**, *Senior Lecturer, History*. BA, 1989, MA, 1994, University of Colorado; PhD, University of California-Santa Barbara, 2007
- Jenkins, Eleanor W.**, *Associate Professor, Mathematical Sciences*. BS, Wofford College, 1988; MS, Clemson University, 1990; PhD, North Carolina State University, 2000
- Jeray, Kyle J.**, *Adjunct Assistant Professor, Bioengineering*. BS, University of Illinois, 1988; MD, University of Illinois, 1992
- Jerzmanowski, Michal M.**, *Associate Professor, Economics*. MA, University of Warsaw (Poland), 1998; MA, 2000, PhD, 2003, Brown University
- Jesch, Elliot D.**, *Assistant Professor, Food, Nutrition, & Packaging Sciences*. BS, 2003, MS, 2005, PhD, 2008, University of Nebraska
- Jiang, Xiuping**, *Professor, Food, Nutrition, & Packaging Sciences*. BS, 1984, MS, 1987, Ocean University of Qingdao (China); PhD, University of Maryland, 1996
- Joerg, Christina S.**, *Assistant Professor, School of Computing*. Vordiplom, Albert Ludwig University of Freiburg (Germany), 1999; Diplom-Ingenieur, Hamburg University of Applied Sciences (Germany), 2005; PhD, Trinity College (Ireland), 2011
- Johns, Jason P.**, *Adjunct Instructor, Agricultural & Environmental Sciences*. BS, 1998, MS, 1996, Clemson University
- Johnson, Alan R.**, *Associate Professor, Forestry & Environmental Conservation*. BS, Colorado State University, 1980; PhD, University of Tennessee, 1988
- Johnson, Cassandra Y.**, *Adjunct Assistant Professor, Forestry & Environmental Conservation*. BBA, 1987, MA, 1995, PhD, 2001, University of Georgia
- Johnson, Charles C.**, *Visiting Lecturer, Mathematical Sciences*. BS, 2005, MS, 2007, Western Carolina University; PhD, Clemson University, 2014
- Johnson, Christa C.**, *Lecturer, Mathematical Sciences*. BS, Western Carolina University, 2008; MS, Clemson University, 2012
- Johnson, Eric G.**, *Endowed Chair, Electrical & Computer Engineering*. BS, Purdue University, 1985; MS, University of Central Florida, 1989; PhD, University of Alabama-Huntsville, 1996
- Johnson, Johanna E.**, *Lecturer, Animal & Veterinary Sciences*. BS, Michigan State University, 2004; MS, 2007, PhD, 2011, Pennsylvania State University
- Johnson, Kendra L.**, *Associate Professor, Performing Arts*. BA, James Madison University, 1987; MFA, University of Tennessee, 1994
- Johnson, Terri A.**, *Senior Lecturer, Mathematical Sciences*. BS, Ball State University, 1974; MS, University of South Carolina, 1982; PhD, Clemson University, 1992
- Johnson, William H.**, *Lecturer, School of Accountancy & Finance*. BBA, 1969, MBA, 1972, Emory University
- Jones, Carol D.**, *Senior Lecturer, Graphic Communications*. BS, 1988, MHRD, 1996, Clemson University
- Jones, James H.**, *Lecturer, School of Computing*. BS, Clemson University, 1957
- Jones, Jeryl C.**, *Professor, Animal & Veterinary Sciences*. BS, Clemson University, 1979; DVM, University of Georgia, 1982; PhD, Auburn University, 1995
- Jones, Karyn O.**, *Department Head and Associate Professor, Communication Studies*. BS, Georgia Southern University, 1992; MA, 1994, PhD, 2003, University of Georgia
- Jones, Michael A.**, *Associate Professor, Agricultural & Environmental Sciences*. BS, 1989, MS, 1991, PhD, 1994, North Carolina State University
- Jones, Robert H., Sr**, *Vice President, Provost & Vice President for Academic Affairs*. BS, 1979, MS, 1981, Clemson University; PhD, State University of New York College of Environmental Science and Forestry, 1986
- Jones, Roy L.**, *Associate Professor, Call Me Mister Program; Associate Professor, Educational & Organizational Leadership Development*. BA, University of Massachusetts-Amherst, 1972; MA, Atlanta University, 1977; EDD, University of Georgia, 1981
- Jones, William M., Jr.**, *Adjunct Assistant Professor, Electrical & Computer Engineering*. BS, 1999, MS, 2000, PhD, 2005, Clemson University
- Jordan, Steven P.**, *Assistant Professor, Aerospace Studies; Captain, U.S. Air Force*. BS, North Carolina State University, 2004; MS, Air Force Institute of Technology, 2007
- Jorgensen, Jo Anne**, *Senior Lecturer, Psychology*. BS, Baylor University, 1979; MBA, Southern Methodist University, 1980; PhD, Clemson University, 2002
- Joseph, Anjali**, *Endowed Chair, School of Architecture*. BArch, School of Planning and Architecture-Delhi (India), 2015; MArch, Kansas State University, 2001; PhD, Georgia Institute of Technology, 2006
- Joseph, Paul F.**, *Professor, Mechanical Engineering*. BA, Franklin and Marshall College, 1979; MS, 1982, PhD, 1987, Lehigh University
- Juang, Charnghsein**, *Professor, Civil Engineering*. BS, 1974, MS, 1976, National Cheng Kung University (Taiwan); PhD, Purdue University, 1981; PE
- Julian, Dinah G.**, *Librarian, University Libraries*. BS, Tennessee Technological University, 1979; MBA, Middle Tennessee State University, 1980; MLIS, University of Tennessee, 1989
- Kaas, Roger L.**, *Adjunct Associate Professor, Food, Nutrition, & Packaging Sciences*. BS, University of Wisconsin, 1966; DSc, Washington University, 1971
- Kahera, Akel I.**, *Associate Dean for Research and Graduate Studies, College of Architecture, Arts & Humanities; Professor, School of Architecture*. BArch, Pratt Institute, 1977; MS, Massachusetts Institute of Technology, 1987; MA, 1996, PhD, 1997, Princeton University
- Kaisa, Tafadzwa R.**, *Senior Lecturer, Biological Sciences*. BS, Syracuse University, 1986; MS, Frostburg State University, 1989; PhD, State University of New York, 1993
- Kaminski, Rebecca A.**, *Lecturer, Teaching & Learning*. BS, West Virginia University, 1971; MEd, 1974, EdD, 1994, University of Pittsburgh
- Kang, Hye Jung**, *Assistant Professor, Physics & Astronomy*. BS, 1993, MS, 1995, Gyeongsang National University (Korea); PhD, University of Tennessee, 2005
- Kang, Qian**, *Adjunct Assistant Professor, Bioengineering*. MD, Beijing Zhigong School of Medicine (China), 1979
- Kanno, Yoichiro**, *Assistant Professor, Forestry & Environmental Conservation*. BA, Meiji University (Japan), 2000; MES, Dalhousie University (Canada), 2002; PhD, University of Connecticut, 2010
- Kapadia, Apoorva D.**, *Visiting Assistant Professor, Electrical & Computer Engineering*. BE, University of Mumbai (India), 2002; MS, 2004, PhD, 2013, Clemson University
- Kaplan, Daniel I.**, *Adjunct Associate Professor, Environmental Engineering & Earth Sciences*. BS, 1977, MS, 1983, University of New Hampshire; PhD, University of Georgia, 1993

- Kappes, John J.**, *Adjunct Professor, Forestry & Environmental Conservation*. BS, 1986, MS, 1993, PhD, 2004, University of Florida
- Karanfil, Tanju**, *Associate Dean for Research and Graduate Studies, College of Engineering & Science; Professor, Environmental Engineering and Earth Science*. BS, Istanbul Technical University (Turkey), 1988; MS, 1991, PhD, 1995, University of Michigan
- Karlen, Douglas L.**, *Adjunct Associate Professor, Agricultural & Environmental Sciences*. BS, University of Wisconsin, 1973; MS, Michigan State University, 1975; PhD, Kansas State University, 1978
- Katsiyannis, Antonis**, *Alumni Professor, Teaching & Learning*. BA, Hellenic College-Holy Cross Greek Orthodox School of Theology, 1983; MEd, Virginia Commonwealth University, 1986; EdD, College of William and Mary, 1989
- Katuri, Kalyan C.**, *Lecturer, Mechanical Engineering*. BTech, Jawaharlal Nehru Technological University (India), 2003; MS, 2006, PhD, 2012, North Carolina State University
- Katz, Steven B.**, *Roy Pearce Professor of Professional Communication, English*. BA, Michigan State University, 1977; MA, University of Rhode Island, 1980; PhD, Rensselaer Polytechnic Institute, 1988
- Kautz, Steven A.**, *Adjunct Professor, Bioengineering*. BS, Michigan State University, 1983; MA, 1987, PhD, 1989, University of Texas; PhD, University of California-Davis, 1992
- Kaye, Nigel G.**, *Associate Professor, Civil Engineering*. BEng, University of New South Wales (Australia), 1993; PhD, University of Cambridge (England), 1998
- Kees, Christopher E.**, *Adjunct Professor, Mathematical Sciences*. BS, Millsaps College, 1994; MS, 1996, PhD, 2001, University of North Carolina
- Keinath, Anthony P.**, *Professor, Agricultural & Environmental Sciences*. BS, Michigan State University, 1982; MS, 1985, PhD, 1988, Cornell University
- Kemper, Karen A.**, *Associate Professor, Public Health*. BS, 1983, MS, 1986, PhD, 1992, University of South Carolina
- Kendall, Brenden E.**, *Assistant Professor, Communication Studies*. BA, University of Montana, 2003; MS, 2005, PhD, 2011, University of Utah
- Kenamer, James E.**, *Adjunct Professor, Forestry & Environmental Conservation*. BS, Auburn University, 1964; MS, 1967, PhD, 1970, Mississippi State University
- Kennedy, Frances A.**, *Director and Professor, School of Accountancy & Finance*. BA, University of Saint Thomas-Saint Paul, 1975; MBA, Ashland University, 1996; PhD, University of North Texas, 2001; CPA (Texas, inactive)
- Kennedy, Marian S.**, *Associate Professor, School of Materials Science & Engineering*. BS, 2002, MS, 2003, PhD, 2007, Washington State University
- Kerivin, Herve**, *Adjunct Assistant Professor, Mathematical Sciences*. General University Studies Degree, 1992, Bachelor's Certificate, 1993, University of Western Brittany (France); MS, Joseph Fourier University (France), 1994; PhD, Blaise Pascal University (France), 2000
- Kern, Michael J.**, *Adjunct Professor, Bioengineering*. BA, Thomas More College, 1983; PhD, University of Kentucky, 1990
- Kerrigan, Julia L.**, *Associate Professor, Agricultural & Environmental Sciences*. BS, University of Michigan, 1990; MS, University of Georgia, 1993; PhD, Washington State University, 2001
- Khademi, Amin**, *Assistant Professor, Industrial Engineering*. BS, 2006, MS, 2008, Sharif University of Technology (Iran); PhD, University of Pittsburgh, 2013
- Khalilian, Ahmad**, *Professor, Agricultural & Environmental Sciences*. BS, University of Tehran (Iran), 1971; MS, University of California, 1977; PhD, Oklahoma State University, 1980
- Khan, Abdul A.**, *Associate Professor, Civil Engineering*. BSc, NWFP University of Engineering and Technology (Pakistan), 1986; MSc, 1989, PhD, 1995, University of Alberta (Canada)
- Khan, Taufiqar R.**, *Professor, Mathematical Sciences*. AB, Occidental College, 1994; MS, 1999, PhD, 2000, University of Southern California
- Kholodenko, Arkady L.**, *Professor, Chemistry*. MS, Kiev State University (Ukraine), 1976; PhD, University of Chicago, 1982
- Kiessler, Peter C.**, *Professor, Mathematical Sciences*. BS, 1977, MS, 1980, PhD, 1983, Virginia Tech
- Kilgo, John C.**, *Adjunct Assistant Professor, Forestry & Environmental Conservation*. BS, Wofford College, 1979; MS, University of Florida, 1992; PhD, University of Georgia, 1996
- Kimbrough-Melton, Robin J.**, *Adjunct Faculty, Institute on Family & Neighborhood Life*. BS, Southern Methodist University, 1977; JD, University of Nebraska College of Law, 1983
- Kimmel, Robert M.**, *Associate Professor, Food, Nutrition, & Packaging Sciences*. BS, 1964, MS, 1965, MatE, 1967, ScD, 1968, Massachusetts Institute of Technology
- Kindy, Mark S.**, *Adjunct Professor, Bioengineering*. BS, University of Massachusetts-Amherst, 1980; MS, 1985, PhD, 1987, Boston University
- King, Bruce M.**, *Professor, Psychology*. BA, University of California-Los Angeles, 1968; PhD, University of Chicago, 1978
- King, Jeremy**, *Professor, Physics & Astronomy*. BA, Boston University, 1988; MS, 1990, PhD, 1993, University of Hawaii
- Kingree, Jeffrey B.**, *Professor, Public Health*. BA, Vanderbilt University, 1984; MA, Florida Atlantic University, 1991; PhD, Georgia State University, 1993
- Kirk, James P.**, *Adjunct Associate Professor, Forestry & Environmental Conservation*. BS, 1970, MA, 1974, PhD, 1984, Auburn University
- Kirk, Kendall R.**, *Extension Associate, Edisto Research & Education Center; Adjunct Assistant Professor, Agricultural & Environmental Sciences*. BS, 2002, MS, 2004, PhD, 2010, Clemson University
- Kirk, Matthew J.**, *Lecturer, Academic Success Center*. BA, Wake Forest University, 2010; MEd, Clemson University, 2014
- Kirkwood, Keith L.**, *Adjunct Professor, Bioengineering*. BA, 1987, DDS, 1991, West Virginia University; PhD, State University of New York-Buffalo, 1997
- Kishimoto, Toshiko**, *Associate Professor, Languages*. BA, Rikkyo University (Japan), 1967; MEd, University of Massachusetts, 1976
- Kitchens, Christopher L.**, *Associate Professor, Chemical & Biomolecular Engineering*. BS, Appalachian State University, 1999; PhD, Auburn University, 2004
- Klaine, Stephen J.**, *Professor, Biological Sciences*. BS, University of Cincinnati, 1979; MS, 1981, PhD, 1982, Rice University
- Klar, Hans W.**, *Assistant Professor, Educational & Organizational Leadership Development*. BS, University of Southern Maine, 1991; MEd, University of Sydney (Australia), 1995; PhD, University of Wisconsin, 2010
- Klein, Matthew C.**, *Lecturer, MBA Program*. BA, College of Charleston, 2001; MBA, Babson College, 2011
- Kline, George L.**, *Adjunct Lecturer, History*. BA, 1947, MA, 1948, PhD, 1950, Columbia University
- Kloot, Robin W.**, *Adjunct Associate Professor, Agricultural & Environmental Sciences*. BSc, University of Cape Town (South Africa), 1982; MBA, 1998, PhD, 2005, University of South Carolina
- Klotz, Leidy E.**, *Associate Professor, Civil Engineering*. BS, Lafayette College, 2000; MS, University of Washington, 2005; PhD, Pennsylvania State University, 2008
- Kluepfel, Daniel A.**, *Adjunct Professor, Agricultural & Environmental Sciences*. BA, University of Missouri, 1978; PhD, University of Florida, 1984
- Knapp, Daniel R.**, *Adjunct Professor, Bioengineering*. BA, University of Evansville, 1965; PhD, Indiana University, 1969
- Knouse, Terry D.**, *Lecturer, School of Accountancy & Finance*. BS, Wendell Castle Workshop, 1976; MPA, Clemson University, 1995
- Knoepfel, Robert C.**, *Department Head and Associate Professor, Educational & Organizational Leadership Development*. BA, University of North Carolina, 1988; MEd, 1992, PhD, 2001, University of Virginia
- Knowles, Patricia A.**, *Associate Professor, Marketing*. BA, Michigan State University, 1976; MA, 1980, PhD, 1987, Bowling Green State University
- Knox, David K.**, *Lecturer, Assessment; Adjunct Lecturer, School of Architecture*. BA, University of South Florida, 1983; PhD, University of Georgia, 2004
- Kohlmeyer, James M., III**, *Assistant Professor, School of Accountancy & Finance*. BA, Cedarville University, 1986; MBA, Northern Illinois University, 1988; PhD, Northern Illinois University, 2001
- Koley, Goutam**, *Professor, Electrical & Computer Engineering*. BTech, Indian Institute of Technology (India), 1998; MS, University of Massachusetts-Lowell, 1999; PhD, Cornell University, 2003
- Kolis, Joseph W.**, *Professor, Chemistry*. BS, Worcester Polytechnic Institute, 1979; PhD, Northwestern University, 1984
- Kopera, Kevin W.**, *Adjunct Professor, Automotive Engineering*. BS, Niagara University, 1984; MD, State University of New York-Buffalo, 1988; MS, Medical College of Wisconsin, 2002
- Kornev, Konstantin G.**, *Professor, School of Materials Science & Engineering*. BS, 1983, MS, 1983, PhD, 1988, Kazan State University (Russia)
- Kosinski, Robert J.**, *Professor, Biological Sciences*. BS, Seton Hall University, 1972; PhD, Rutgers University, 1977
- Kowalski, Robin M.**, *Professor, Psychology*. BA, Furman University, 1985; MA, Wake Forest University, 1987; PhD, University of North Carolina-Greensboro, 1990
- Kozubowski, Lukasz**, *Assistant Professor, Genetics & Biochemistry*. MSc, Medical University of Warsaw (Poland), 1996; PhD, Louisiana State University Health Sciences Center, 2004
- Kraemer, Eileen T.**, *Department Head and Professor, School of Computing*. BA, Hofstra University, 1980; MS, Polytechnic University, 1986; PhD, Georgia Institute of Technology, 1995
- Kramer, Daniel P.**, *Adjunct Professor, School of Materials Science & Engineering*. BS, Rutgers University, 1977; MS, Massachusetts Institute of Technology, 1977; MS, 1979, PhD, 1979, Rutgers University
- Krauss, Kenneth W.**, *Adjunct Assistant Professor, Forestry & Environmental Conservation*. MS, Louisiana State University, 1997; BS, 1994, PhD, 2004, University of Louisiana at Lafayette
- Kraveka, Jacqueline M.**, *Adjunct Associate Professor, Bioengineering*. BA, Columbia University, 1989; DO, Nova Southeastern University, 1990
- Krehbiel, Clinton**, *Adjunct Professor, Animal & Veterinary Sciences*. BS, 1988, MS, 1990, Kansas State University; PhD, University of Nebraska, 1994
- Kreider-Mueller, Ava R.**, *Lecturer, Chemistry*. BA, Bard College, 2009; MA, 2011, MPH, 2012, PhD, 2014, Columbia University
- Kresovich, Stephen, Robert and Lois Coker Trustees Chair of Genetics; Director, Institute for Translational Genomics; Professor, Genetics and Biochemistry; Professor, Agricultural & Environmental Sciences. AB, Washington and Jefferson College, 1974; MS, Texas A&M University, 1977; PhD, Ohio State University, 1982**
- Kudera, Alexander P.**, *Lecturer, English*. BA, Wesleyan University, 1991; MFA, Temple University, 1998
- Kuehn, Thomas J.**, *Department Head and Professor, History*. BA, Carleton College, 1972; MA, 1973, PhD, 1977, University of Chicago
- Kumanyika, Chenjerai**, *Assistant Professor, Communication Studies*. BA, 1995, PhD, 2008, Pennsylvania State University
- Kung, Ethan**, *Assistant Professor, Mechanical Engineering*. BSc, Queen's University (Canada), 2003; MS, 2006, PhD, 2010, Stanford University
- Kurtz, Harry D., Jr.**, *Associate Professor, Biological Sciences*. BS, Pennsylvania State University, 1984; PhD, University of Idaho, 1989
- Kurz-Edsall, Mary E.**, *Associate Professor, Industrial Engineering*. BS, 1995, MS, 1997, PhD, 2001, University of Arizona
- Kwartowitz, David M.**, *Assistant Professor, Bioengineering*. BS, Case Western Reserve University, 2003; MS, 2005, PhD, 2007, Vanderbilt University
- Laberge, Martine**, *Department Head and Professor, Bioengineering*. DEC, College de Jonquière (Canada), 1978; MS, École Polytechnique de Montréal (Canada), 1985; BS, 1983, PhD, 1988, University of Montreal (Canada)
- Ladner, David A.**, *Assistant Professor, Environmental Engineering & Earth Sciences*. BS, New Mexico Institute of Mining and Technology, 2003; MS, 2005, PhD, 2009, University of Illinois
- Lake, Ryan N.**, *Lecturer, Philosophy & Religion*. BA, Grand Valley State University, 2003; MA, 2008, PhD, 2013, University of Miami
- Lam, Chungsang**, *Assistant Professor, Economics*. BS, 2003, MPhil, 2005, University of Hong Kong (China); MA, 2008, PhD, 2013, University of Chicago
- Lambert, Renee S.**, *Lecturer, School of Computing*. BS, Eastern Michigan University, 1971
- Lamie, Ronald D.**, *Associate Professor, Agricultural & Environmental Sciences*. BS, 1987, MS, 1989, Purdue University; PhD, Clemson University, 1996

- Lanford, Bobby L.**, *Adjunct Professor, Forestry & Environmental Conservation*. BS, 1965, MS, 1970, Clemson University; PhD, State University of New York College of Environmental Science and Forestry, 1976
- Langan, Eugene M., III**, *Adjunct Professor, Bioengineering; Associate Director, Surgery, Greenville Hospital System*. BS, 1982, MS, 1983, University of Scranton; MD, Georgetown University School of Medicine, 1987
- Lanham, Janice G.**, *Senior Lecturer, School of Nursing*. BS, 1988, MS, 1994, Clemson University
- Lanham, Joseph D.**, *Alumni Professor, Forestry & Environmental Conservation*. BA, 1988, MS, 1990, PhD, 1997, Clemson University
- Lapin, Eric J.**, *Lecturer, Performing Arts*. BM, 2004, MM, 2009, University of South Carolina; PhD, Clemson University, 2013
- Larsen, Miguel F.**, *Professor, Physics & Astronomy*. BS, University of Rochester, 1975; MS, 1977, PhD, 1979, Cornell University
- Larson, Lincoln R.**, *Assistant Professor, Parks, Recreation & Tourism Management*. BS, Duke University, 2003; MS, 2008, PhD, 2012, University of Georgia
- Lascano, Gustavo J.**, *Assistant Professor, Animal & Veterinary Sciences*. BS, Escuela Agricola Panamericana (Honduras), 2004; MSc, 2007, PhD, 2011, Pennsylvania State University
- Lasser, William**, *Director, Calhoun Honors College; Alumni Distinguished Professor, Political Science*. BS, Massachusetts Institute of Technology, 1978; MA, 1983, PhD, 1983, Harvard University
- Latour, Robert A., Jr.**, *McQueen-Quattlebaum Professor, Bioengineering*. BS, University of Virginia, 1979; MS, 1986, PhD, 1989, University of Pennsylvania
- Laurence, Peter L.**, *Assistant Professor, School of Architecture*. BS, University of Southern California, 1992; MArch, Harvard University, 1999; MS, 2004, PhD, 2009, University of Pennsylvania
- Lauria, Mickey**, *Professor, Planning, Development, & Preservation*. BA, University of California-Los Angeles, 1975; MA, 1977, PhD, 1980, University of Minnesota
- Lauritis, Beth A.**, *Assistant Professor, Art*. MA, University of California-Riverside, 1999; BA, 1989, PhD, 2009, University of California-Los Angeles
- Lauro, Sarah**, *Visiting Assistant Professor, English*. BA, University of California, 2000; MA, New York University, 2004; MA, 2006, PhD, 2011, University of California-Davis
- Lavenda, Osnat**, *Adjunct Faculty, Institute on Family & Neighborhood Life*. BA, University of Haifa (Israel), 1996; MA, 2000, PhD, 2009, Hebrew University of Jerusalem (Israel)
- Lawton Rauh, Amy L.**, *Associate Professor, Genetics & Biochemistry*. BS, University of Missouri, 1997; PhD, North Carolina State University, 2003
- Layfield, Kevin D.**, *Associate Professor, Agricultural & Environmental Sciences*. BS, 1989, MAg, 1994, University of Florida; PhD, Pennsylvania State University, 1998
- Layton, Evguenia P.**, *Assoc Academic Program Dir, MBA Program*. BS, College of Charleston, 2005; MBA, Clemson University, 2011
- Layton, Patricia A.**, *Professor, Forestry & Environmental Conservation*. BS, Clemson University, 1976; MS, Texas A&M University, 1978; PhD, University of Florida, 1985
- LeBlanc, Gerald A.**, *Adjunct Professor, Biological Sciences*. BS, University of Massachusetts-Dartmouth, 1975; MA, Bridgewater State College, 1981; PhD, University of South Florida, 1986
- Lee, Cindy M.**, *Professor, Environmental Engineering & Earth Sciences*. BA, Indiana University, 1977; BA, University of Colorado, 1984; PhD, Colorado School of Mines, 1990
- Lee, David M.**, *Assistant Professor, School of Architecture*. BA, 2000, BArch, 2002, University of North Carolina-Charlotte; MArch, Columbia University, 2003
- Lee, Hyesuk K.**, *Professor, Mathematical Sciences*. BS, Yonsei University (Korea), 1986; MS, 1995, PhD, 1997, Virginia Tech
- Lee, JeungSoo**, *Assistant Professor, Bioengineering*. BS, 1986, MS, 1994, PhD, 1999, Pusan National University (Korea)
- Leffakis, Zachary M.**, *Lecturer, Management*. BS, 1993, MS, 1995, California University of Pennsylvania; PhD, University of Toledo, 2009
- Lehmacher, Gerald A.**, *Associate Professor, Physics & Astronomy*. MS, 1988, PhD, 1993, University of Bonn (Germany)
- Leifeste, Amalia T.**, *Assistant Professor, Planning, Development, & Preservation*. BArch, University of Oregon, 2007; MArch, University of Texas, 2012
- Leimgruber, Peter**, *Adjunct Professor, Biological Sciences*. BS, 1988, MS, 1992, Christian Albrechts University of Kiel (Germany); PhD, University of Oklahoma, 1998
- Leininger, John M.**, *Professor, Graphic Communications*. BS, State University of New York, 1978; MInEd, 1981, EdD, 1991, Clemson University
- Leising, Mark D.**, *Department Head and Professor, Physics & Astronomy*. BS, University of Notre Dame, 1982; MS, 1985, PhD, 1987, Rice University
- LeMahieu, Michael L.**, *Associate Professor, English*. BA, Marquette University, 1996; MA, 1997, PhD, 2005, University of Wisconsin
- Lemons, Andrew M.**, *Assistant Professor, English*. BA, 2002, MA, 2006, University of Georgia; MA, University of Iceland (Iceland), 2007; MA, 2009, PhD, 2014, Princeton University
- Leonard, Alison E.**, *Assistant Professor, Teaching & Learning*. BA, University of Minnesota, 2003; MA, New York University, 2006; PhD, University of Wisconsin, 2012
- Leube, Helmut**, *Adjunct Professor, Automotive Engineering*. BS, 1979, PhD, 1986, RWTH Aachen University (Germany)
- Levin, Andrew R.**, *Associate Professor, Performing Arts; Director of Orchestral Activities*. BA, California State University, 1980; MM, Rice University, 1983; DA, Ball State University, 1993
- Levine, Joshua A.**, *Assistant Professor, School of Computing*. BSE, 2003, BS, 2003, MS, 2004, Case Western Reserve University; PhD, Ohio State University, 2009
- Lewis, Barbara S.**, *Instructor, Chemistry*. BS, Radford University, 1973
- Lewis, Matthew S.**, *Associate Professor, Economics*. BS, University of Illinois, 1998; PhD, University of California, 2004
- Lewis, Stephen T.**, *Lecturer, Parks, Recreation & Tourism Management*. BS, 1999, MS, 2000, Florida State University; PhD, Indiana University, 2012
- Li, Gang**, *Associate Professor, Mechanical Engineering*. BS, 1993, MEng, 1996, Tongji University (China); MAsc, Dalhousie University (Canada), 1999; PhD, University of Illinois, 2003
- Li, Siyuan**, *Assistant Professor, Management*. BBA, Hong Kong University of Science and Technology (China), 2006; PhD, University of Georgia, 2013
- Li, Yingbo**, *Assistant Professor, Mathematical Sciences*. BS, Peking University (China), 2008; MS, 2011, PhD, 2013, Duke University
- Liang, Haiying**, *Associate Professor, Genetics & Biochemistry*. BS, 1990, MS, 1993, Beijing Forestry University (China); PhD, State University of New York College of Environmental Science and Forestry, 2000
- Li-Bleuel, Linda L.**, *Professor, Performing Arts*. BM, University of Illinois, 1985; MM, 1987, DMA, 1998, University of Georgia
- Lickfield, Gary C.**, *Professor, School of Materials Science & Engineering*. BS, Ursinus College, 1978; PhD, Clemson University, 1983
- Liebel, Ann M.**, *Lecturer, Teaching & Learning*. BA, College of New Jersey, 1994; EdD, University of Pennsylvania, 2012
- Liebenberg, Donald H.**, *Adjunct Professor, Physics & Astronomy*. BS, 1954, MS, 1956, PhD, 1971, University of Wisconsin
- Ligon, Walter B.**, *Associate Professor, Electrical & Computer Engineering*. BS, 1987, MS, 1988, PhD, 1992, Georgia Institute of Technology
- Limber, Susan P.**, *Associate Director and Professor, Institute on Family & Neighborhood Life*. BA, University of Virginia, 1985; MLS, 1990, MA, 1990, PhD, 1992, University of Nebraska
- Linder, Sandra M.**, *Assistant Professor, Teaching & Learning*. BFA, Montclair State University, 2001; MEd, Georgian Court University, 2005; PhD, Clemson University, 2009
- Lindle, Jane C.**, *Distinguished Professor, Educational and Organizational Leadership Development*. BA, University of North Carolina, 1976; MS, 1982, PhD, 1983, University of Wisconsin
- Ling, Kai-Shu**, *Adjunct Associate Professor, Agricultural & Environmental Sciences*. BS, Fujian Agricultural College (China), 1983; PhD, Cornell University, 1995
- Linville, Darren L.**, *Assistant Professor, Communication Studies*. BA, 1999, MA, 2002, Wake Forest University; PhD, Clemson University, 2008
- Liska, Roger W.**, *Department Head and Professor, Construction Science & Management*. BSCE, Michigan Technological University, 1965; MSCE, Wayne State University, 1967; EDD, University of Georgia, 1988
- Liu, Haibo**, *Professor, Agricultural & Environmental Sciences*. BS, Beijing Forestry University (China), 1982; MS, University of Illinois, 1988; PhD, University of Rhode Island, 1992
- Liu, Shitao**, *Assistant Professor, Mathematical Sciences*. BS, Nankai University (China), 2006; MS, 2008, PhD, 2011, University of Virginia
- Liu, Xin**, *Assistant Professor, Mathematical Sciences*. BS, University of Science and Technology of China (China), 2006; MS, 2009, PhD, 2011, University of North Carolina
- Lockaby, Bruce G.**, *Adjunct Professor, Forestry & Environmental Conservation*. BS, 1975, MS, 1977, Clemson University; PhD, Mississippi State University, 1981
- Lockhart, George B.**, *Assistant Professor, School of Accountancy & Finance*. BS, Georgia Institute of Technology, 1998; PhD, University of Florida, 2009
- Loeb, Susan C.**, *Adjunct Associate Professor, Forestry & Environmental Conservation; Research Ecologist, U.S. Forest Service*. AB, Stanford University, 1976; MS, 1981, PhD, 1987, University of California-Davis
- Lombardi, Valentina**, *Lecturer, Languages*. BA, 2004, MS, 2007, University of Perugia (Italy); MA, Middlebury College, 2013
- Long, Nathan M.**, *Assistant Professor, Animal & Veterinary Sciences*. BS, Clemson University, 2002; MS, University of Georgia, 2004; PhD, Oklahoma State University, 2008
- Long, Robin E.**, *Lecturer, Agricultural & Environmental Sciences*. BS, 2005, MS, 2007, Oklahoma State University
- Looney, Brian B.**, *Adjunct Professor, Environmental Engineering & Earth Sciences*. BS, Texas Christian University, 1978; PhD, University of Minnesota, 1983
- Love, Gordon J.**, *Professor, Languages*. BA, University of Toronto (Canada), 1984; LLB, Queen's University (Canada), 1987; MA, 1994, PhD, 2000, Yale University
- Lowe, Rose M.**, *Senior Lecturer, School of Computing*. BS, Jackson State University, 1971; MA, University of Michigan, 1974; MS, Georgia Institute of Technology, 1983; PhD, Clemson University, 2010
- Lowe, Terry C.**, *Adjunct Professor, School of Materials Science & Engineering*. BS, University of California-Davis, 1978; MS, 1979, PhD, 1983, Stanford University
- Lucas, Jason D.**, *Assistant Professor, Construction Science & Management*. BArch, New Jersey Institute of Technology, 2004; MS, 2008, PhD, 2012, Virginia Tech
- Lucas, Richard A.**, *Senior Lecturer, Parks, Recreation & Tourism Management*. BS, Old Dominion University, 1982; MBA, Virginia Commonwealth University, 1993
- Luckow, Andre**, *Adjunct Assistant Professor, School of Computing*. BS, Hamburg University of Applied Sciences (Germany), 2003; MS, 2005, Dr.rer.nat, 2009, University of Potsdam (Germany)
- Luer, Carl A.**, *Adjunct Professor, Animal & Veterinary Sciences*. AB, Duke University, 1970; MA, University of South Florida, 1974; PhD, University of Kansas Medical Center, 1978
- Lund, Robert B.**, *Professor, Mathematical Sciences*. BS, 1986, MS, 1988, Auburn University; PhD, University of North Carolina, 1993
- Luo, Feng**, *Associate Professor, School of Computing*. BS, Chengdu University of Science and Technology (China), 1992; MS, East China University of Science and Technology (China), 1997; MS, 2001, PhD, 2004, University of Texas-Dallas
- Luo, Hong**, *Professor, Genetics & Biochemistry*. BS, 1983, MS, 1986, Sichuan Agricultural University (China); MS, 1990, PhD, 1995, Catholic University of Louvain (Belgium)
- Luo, Jun**, *Associate Professor, Mathematical Sciences*. BS, University of Science and Technology (China), 2002; MS, 2004, PhD, 2006, Michigan State University
- Luo, Ye**, *Associate Professor, Sociology*. BS, 1988, MS, 1991, Peking University (China); MA, 1994, PhD, 1999, Tulane University
- Lupo, Donald W.**, *Adjunct Professor, School of Materials Science & Engineering*. BS, Davidson College, 1978; PhD, Indiana University, 1984
- Luzinov, Igor A.**, *Professor, School of Materials Science & Engineering*. MS, 1985, PhD, 1990, Lviv Polytechnic Institute (Ukraine)
- Lynn, Louis B.**, *Adjunct Professor, Agricultural & Environmental Sciences*. BS, 1970, MS, 1972, Clemson University; PhD, University of Maryland, 1975
- Maass, Peter M.**, *Adjunct Professor, Mathematical Sciences*. Diploma, University of Heidelberg (Germany), 1985; PhD, Technical University of Berlin (Germany), 1988

- MacAlystre, Megan N.**, *Lecturer, English*. BA, 2001, MA, 2004, University of California-Riverside
- Macauley, Matthew**, *Associate Professor, Mathematical Sciences*. BS, Harvey Mudd College, 2003; MA, 2005, PhD, 2008, University of California-Santa Barbara
- Machlis, Gary E.**, *Professor, National Institute for Parks*. BA, 1973, MS, 1975, University of Washington; MPhil, 1978, PhD, 1979, Yale University
- Mack, Pamela E.**, *Associate Professor, History*. AB, Harvard University, 1977; PhD, University of Pennsylvania, 1983
- Mackiewicz, Sara M.**, *Assistant Professor, Educational & Organizational Leadership Development*. BA, 1997, MEd, 1998, Clemson University; SSP, Winthrop University, 2002; PhD, University of North Carolina-Charlotte, 2010
- Macklin, William A.**, *Adjunct Assistant Professor, Forestry & Environmental Conservation*. AB, Harvard University, 1997; PhD, University of North Carolina, 2004
- Madray, J. Russell**, *Senior Lecturer, School of Accountancy & Finance*. BS, 1986, MPAcc, 1988, Clemson University; CPA (North Carolina, South Carolina), CFM, CIA, CMA
- Mahroof, Rizana M.**, *Adjunct Assistant Professor, Agricultural & Environmental Sciences*. BS, University of Peradeniya (Sri Lanka), 1996; MPh, University of Edinburgh (Scotland), 2000; PhD, Kansas State University, 2004
- Mai, Joseph H.**, *Associate Professor, Languages*. BA, Northern Illinois University, 1992; MA, University of Illinois, 1996; MPhil, 1999, PhD, 2004, Yale University
- Maier, Jonathan R.**, *Lecturer, General Engineering*. BS, Georgia Institute of Technology, 1999; MS, 2000, PhD, 2005, Clemson University
- Maker, William A.**, *Department Head and Professor, Philosophy & Religion*. BA, University of Massachusetts, 1971; MA, 1975, PhD, 1978, New School for Social Research
- Makram, Elham B.**, *SCE&G Distinguished Professor, Electrical & Computer Engineering*. BS, Assiut University (Egypt), 1969; MS, 1978, PhD, 1981, Iowa State University
- Malloy, Brian A.**, *Associate Professor, School of Computing*. BA, La Salle University, 1968; MEd, 1975, MS, 1983, PhD, 1990, University of Pittsburgh
- Malloy, Jacquelyn A.**, *Assistant Professor, Teaching & Learning*. BA, Duquesne University, 1979; MS, West Virginia University, 1980; PhD, Clemson University, 2008
- Manganelli, Kimberly S.**, *Associate Professor, English*. BA, 1998, MA, 2000, Auburn University; MA, 2003, PhD, 2006, Cornell University
- Manganiello, Felice**, *Assistant Professor, Mathematical Sciences*. MS, University of Pisa (Italy), 2005; PhD, University of Zurich (Switzerland), 2011
- Manhiani, Paljinder S.**, *Adjunct Assistant Professor, Food, Nutrition, & Packaging Sciences*. BS, 2002, MS, 2004, Guru Nanak Dev University (India); PhD, Clemson University, 2010
- Mann, Christopher Rex**, *Professor, Aerospace Studies*. BS, United States Air Force Academy, 1991; MS, Georgia Institute of Technology, 1992; MA, George Washington University, 1998; PhD, Air Force Institute of Technology, 2007
- Manson, Joseph R., V.**, *Senior Lecturer, Art*. BFA, Clemson University, 1994; MFA, Alfred University, 1996
- Marcotte, William R., Jr.**, *Department Head and Professor, Genetics & Biochemistry*. BS, Virginia Tech, 1980; PhD, University of Virginia Medical School, 1987
- Marcus, Richard K.**, *Professor, Chemistry*. BS, Longwood College, 1982; PhD, University of Virginia, 1986
- Marinescu, Domnita C.**, *Professor, Physics & Astronomy*. BS, 1991, MS, 1991, University of Bucharest (Romania); PhD, Purdue University, 1996
- Marion, Russell A.**, *Professor, Leadership, Educational & Organizational Leadership Development*. BA, 1967, MAT, 1968, MEd, 1976, PhD, 1976, University of North Carolina
- Marks, Richard D., III**, *Adjunct Lecturer, Planning, Development, & Preservation*. MS, University of Pennsylvania, 1995
- Marks, Steven G.**, *Alumni Professor, History*. BA, Miami University, 1980; MA, 1981, PhD, 1988, Harvard University
- Markwald, Roger R.**, *Adjunct Professor, Bioengineering*. BS, California State Polytechnic University, 1965; MS, 1968, PhD, 1969, Colorado State University
- Marler, Joan P.**, *Assistant Professor, Physics & Astronomy*. BA, Wellesley College, 1999; PhD, University of California-San Diego, 2013
- Marra, Peter P.**, *Adjunct Professor, Forestry & Environmental Conservation*. BS, Southern Connecticut State University, 1985; MS, Louisiana State University, 1989; PhD, Dartmouth College, 1998
- Marren, David G.**, *Adjunct Professor, Agricultural & Environmental Sciences*. BS, University of Massachusetts-Amherst, 1991; JD, New England School of Law, 1996
- Marsala, Anthony J.**, *Adjunct Faculty, Institute on Family & Neighborhood Life*. BA, Baldwin-Wallace College, 1962; PhD, Pennsylvania State University, 1968
- Marsh, Christopher P.**, *Adjunct Assistant Professor, Forestry & Environmental Conservation*. BS, North Carolina State University, 1977; PhD, Oregon State University, 1984
- Marshall, Jeff C.**, *Associate Professor, Teaching & Learning*. BS, University of Central Oklahoma, 1991; MS, 2002, PhD, 2004, Indiana University
- Marshall, Michael W.**, *Assistant Professor, Agricultural & Environmental Sciences*. BS, 1998, MS, 2000, Kansas State University; PhD, University of Kentucky, 2005
- Martin II, James R.**, *Department Head and Professor, Civil Engineering*. BS, The Citadel, 1985; MS, 1987, PhD, 1990, Virginia Tech
- Martin, Anthony Q.**, *Associate Professor, Electrical & Computer Engineering*. BS, 1980, MS, 1983, University of Mississippi; PhD, Clemson University, 1989
- Martin, James J.**, *Associate Professor, School of Computing*. BS, University of Illinois, 1983; MS, Arizona State University, 1989; PhD, North Carolina State University, 1999
- Martin, Julie P.**, *Assistant Professor, Engineering & Science Education*. BS, North Carolina State University, 1996; PhD, Virginia Tech, 2001
- Martin, Samuel B., Jr.**, *Professor, Agricultural & Environmental Sciences*. BA, Hendrix College, 1976; MS, University of Arkansas, 1978; PhD, North Carolina State University, 1982
- Martin, William D., III**, *Lecturer, General Engineering*. BS, 2010, MS, 2011, PhD, 2013, Clemson University
- Martin-Armas, Juana**, *Lecturer, Languages*. BA, University of Las Palmas de Gran Canaria (Spain), 1996; MA, Michigan State University, 2000; PhD, University of Colorado, 2006
- Martinez, Nicole E.**, *Assistant Professor, Environmental Engineering & Earth Sciences*. BS, Texas A&M University, 2004; MS, 2010, PhD, 2014, Colorado State University
- Martinez-Dawson, Rose M.**, *Senior Lecturer, Mathematical Sciences*. BS, 1984, MS, 1987, MStat, 1990, North Carolina State University; PhD, Clemson University, 2010
- Martinez-Duarte, Rodrigo**, *Assistant Professor, Mechanical Engineering*. BS, Monterrey Institute of Technology (Mexico), 2004; MS, 2009, PhD, 2010, University of California-Irvine
- Mason, Scott J.**, *Endowed Chair, Industrial Engineering*. BS, 1993, MS, 1995, University of Texas; PhD, Arizona State University, 2000
- Massa, Kristen L.**, *Lecturer, School of Nursing*. BS, 1995, MS, 1999, Clemson University
- Massey, Hunter F.**, *Lecturer, Agricultural & Environmental Sciences*. BS, 2010, MS, 2011, Clemson University
- Mastroianni, Dominic B.**, *Assistant Professor, English*. BA, 1998, MA, 2001, Georgetown University; PhD, Emory University, 2008
- Mathas, Andrew P.**, *Lecturer, English*. BA, Richard Stockton College of New Jersey, 2008; MA, Clemson University, 2012
- Matic, Vladimir**, *Senior Lecturer, Political Science*. BA, 1962, JJD, 1964, University of Belgrade (Serbia)
- Matthews, Gretchen L.**, *Professor, Mathematical Sciences*. BS, Oklahoma State University, 1995; MS, 1997, PhD, 1999, Louisiana State University
- Matthey, Pauline**, *Lecturer, Communication Studies*. BA, 2009, MA, 2013, Eastern Illinois University
- May, Todd G.**, *Named Professor, Philosophy & Religion*. BA, Brown University, 1978; MA, Duquesne University, 1982; PhD, Pennsylvania State University, 1989
- Mayer II, John J.**, *Adjunct Associate Professor, Forestry & Environmental Conservation*. BA, 1974, PhD, 1983, University of Connecticut
- Mayo, Rachel M.**, *Professor, Public Health*. BS, 1991, MA, 1993, University of Arkansas; PhD, University of South Carolina, 1997
- Mayorga, Maria E.**, *Adjunct Associate Professor, Industrial Engineering*. BS, George Washington University, 2000; MS, 2002, PhD, 2006, University of California
- Mazer, Joseph P., Jr.**, *Assistant Professor, Communication Studies*. BS, Mansfield University of Pennsylvania, 2003; MS, Illinois State University, 2006; PhD, Ohio University, 2010
- McBride, Mary Ann**, *Lecturer, Education & Human Development*. BS, Frostburg State University, 1975; MEd, Loyola College-Maryland, 1978
- McCarroll, Meredith A.**, *Lecturer, English*. BA, 1998, MA, 2001, Appalachian State University; MA, Simmons College, 2003; PhD, University of Tennessee, 2009
- McCarty, Lambert B.**, *Professor, Agricultural & Environmental Sciences*. MS, North Carolina State University, 1983; BS, 1981, PhD, 1986, Clemson University
- McCave, Erin J.**, *Lecturer, General Engineering*. BS, Michigan Technological University, 2003; PhD, Clemson University, 2014
- McCormick, Robert E.**, *Dean, College of Business & Behavioral Sciences; Professor Emeritus, Economics*. BA, 1972, MA, 1974, Clemson University; PhD, Texas A&M University, 1978
- McCreadie, John W.**, *Adjunct Assistant Professor, Agricultural & Environmental Sciences*. BS, University of Guelph (Canada), 1980; MS, 1984, PhD, 1991, Memorial University of Newfoundland (Canada)
- McCubbin, Donna L.**, *Lecturer, Academic Success Center*. BA, University of North Carolina, 1983; MBA, Clemson University, 2011
- McCubbin, James A.**, *Professor, Psychology*. MA, Wake Forest University, 1976; BA, 1974, PhD, 1980, University of North Carolina
- McDonald, Todd A.**, *Associate Professor, Art*. BFA, University of Texas, 1998; MFA, Arizona State University, 2001
- McDonell, James R.**, *Director and Professor, Institute on Family & Neighborhood Life*. BA, Methodist College, 1971; MSW, University of North Carolina, 1978; PhD, Columbia University, 1988
- McElroy, Joseph S.**, *Adjunct Associate Professor, Agricultural & Environmental Sciences*. BA, 1998, MS, 2000, Auburn University; PhD, North Carolina State University, 2003
- McElveen, Carter W.**, *Lecturer, Marketing*. BS, Clemson University, 2003; MBA, University of South Carolina, 2010
- McGee, Philip H.**, *Senior Lecturer, Educational & Organizational Leadership Development*. BA, Wofford College, 1971; MEd, University of Miami, 1973; MS, 1979, EdD, 1978, Indiana University
- McGrath, Brian M.**, *Associate Professor, English*. BA, Northwestern University, 1996; MA, University of Maine, 1998; PhD, Emory University, 2006
- McGregor, John D.**, *Associate Professor, School of Computing*. BS, 1970, MA, 1971, PhD, 1976, Vanderbilt University
- McGregor, John U.**, *Professor, Food, Nutrition, & Packaging Sciences*. BS, Clemson University, 1982; MS, Louisiana State University, 1984; PhD, Mississippi State University, 1988
- McGuire, Francis**, *Interim Department Head and Professor, Parks, Recreation & Tourism Management*. AB, 1973, Cornell University, MS, 1975, Pennsylvania State University, PhD, 1979, University of Illinois
- McKnew, Judith I.**, *Senior Lecturer, Mathematical Sciences*. BS, 1981, MS, 1986, PhD, 1994, Clemson University
- McKnew, Mark A.**, *Professor, Management*. BS, 1971, MA, 1975, University of California; PhD, Massachusetts Institute of Technology, 1978
- McMahan, Christopher S.**, *Assistant Professor, Mathematical Sciences*. BS, Austin Peay State University, 2006; MS, Western Kentucky University, 2008; PhD, University of South Carolina, 2012
- McMillan, Jeffrey J.**, *Professor, School of Accountancy & Finance*. BS, 1983, MBA, 1984, Louisiana State University; PhD, University of South Carolina, 1990
- McMillan, Kerri D.**, *Senior Lecturer, School of Accountancy & Finance*. BS, Southeastern Louisiana University, 1981; MBA, University of South Carolina, 1988
- McMillan, Patrick D.**, *Academic Program Director, Forestry & Environmental Conservation*. BS, University of North Carolina, 1996; PhD, Clemson University, 2006
- McMillen, Colin D.**, *Lecturer: Non-Teaching, Chemistry*. BS, 2002, PhD, 2007, Clemson University
- McNair, Jonda C.**, *Associate Professor, Education & Human Development*. BA, 1992, MEd, 1994, University of Florida; PhD, Ohio State University, 2003
- McNealy, Tamara L.**, *Associate Professor, Biological Sciences*. BS, University of North Florida, 1992; MS, Middle Tennessee State University, 1999; PhD, University of Heidelberg (Germany), 2002
- McNeil, Jeffrey J.**, *Research Associate Professor, Research Industrial Liaison & Intellectual Property Management*. BA, University of Nebraska, 1992; MA, 1999, PhD, 2010, Old Dominion University

- McNeill, Jason D.**, Associate Professor, Chemistry. BS, Northern Illinois University, 1991; PhD, University of California, 1999
- McNutt-Scott, Tamara L.**, Senior Lecturer, Biological Sciences. BS, Clarion University, 1983; MS, Kent State University, 1985; PhD, Pennsylvania State University, 1990
- Meador, Michael A.**, Adjunct Professor, School of Materials Science & Engineering. BA, Ithaca College, 1978; PhD, Michigan State University, 1983
- Mears, Michael L.**, Associate Professor, Automotive Engineering. BS, Virginia Tech, 1993; MS, 2001, PhD, 2006, Georgia Institute of Technology
- Medlock, Jan P.**, Adjunct Assistant Professor, Mathematical Sciences. BS, 1997, MS, 1999, Georgia Institute of Technology; PhD, University of Washington, 2004
- Medrano, Joe L.**, Senior Instructor, Military Leadership; Master Sergeant, U.S. Army. AAS, Central Texas College, 2011
- Meehan, Nancy K.**, Associate Professor, School of Nursing. BSN, Medical University of South Carolina, 1978; MSN, 1981, PhD, 1985, University of Texas
- Mefford, Olin T., IV**, Associate Professor, School of Materials Science & Engineering. BS, Clemson University, 2003; PhD, Virginia Tech, 2007
- Mei, Ying**, Assistant Professor, Bioengineering. BS, Wuhan University (China), 1994; MS, 2001, PhD, 2003, Polytechnic University
- Melgar Jimenez, Juan C.**, Assistant Professor, Forestry & Environmental Conservation. BS, 2000, PhD, 2006, University of Cordoba (Spain)
- Melloy, Brian J.**, Associate Professor, Industrial Engineering. BSE, 1978, MSIE, 1981, PhD, 1986, University of South Florida
- Mendonca, Michael R.**, Lecturer, School of Accountancy & Finance. BS, United States Air Force Academy, 1983; MBA, Campbell University, 1991
- Meng, Michael L.**, Assistant Professor, History. BA, Boston College, 2001; MA, 2004, PhD, 2008, University of North Carolina
- Mercuri, Jeremy J.**, Assistant Professor, Bioengineering. BS, Drexel University, 2003; MS, 2006, PhD, 2006, Clemson University
- Meriwether, John W., Jr.**, Professor, Physics & Astronomy. BS, Massachusetts Institute of Technology, 1964; PhD, University of Maryland, 1970
- Meyer, Bradley S.**, Professor, Physics & Astronomy. BA, Rice University, 1983; PhD, University of Chicago, 1989
- Meyer, Kathleen M.**, Senior Lecturer, Public Health. BS, 1977, MS, 1982, State University of New York-Cortland
- Mickelsen, Patricia A.**, Adjunct Professor, Biological Sciences. BA, University of North Carolina-Greensboro, 1969; MS, Medical College of Virginia, 1975; PhD, University of North Carolina, 1981
- Mikhailova, Elena**, Associate Professor, Forestry & Environmental Conservation. BS, Colgate University, 1992; MS, 1995, PhD, 1999, Cornell University
- Millar, Heber W.**, Academic Program Director, Teaching & Learning, School Of Education. BS, Indiana University, 1975; MEd, University of Texas, 1985
- Miller, Daniel P.**, Assistant Professor, Economics. BA, Stanford University, 2009; MA, 2008, PhD, 2009, University of Minnesota
- Miller, Janis L.**, Associate Professor, Management. BS, 1978, MBA, 1986, PhD, 1990, University of Missouri
- Miller, Karl V.**, Adjunct Associate Professor, Forestry & Environmental Conservation. BS, Pennsylvania State University, 1979; MS, Ohio State University, 1981; PhD, University of Georgia, 1985
- Miller, Matthew K.**, Visiting Lecturer, General Engineering. BS, 2007, MS, 2008, Clemson University
- Miller, Richard S.**, Associate Professor, Mechanical Engineering. BS, 1992, MS, 1993, PhD, 1995, State University of New York-Buffalo
- Miller, Michelle L.**, Lecturer, Animal & Veterinary Sciences. BS, University of Florida, 2010; MS, North Dakota State University, 2012
- Miller, Steven V.**, Assistant Professor, Political Science. BA, Ohio State University, 2006; PhD, University of Alabama, 2012
- Miller, Tiffany C.**, Assistant Professor, Languages. BA, 2005, MA, 2007, University of North Carolina; PhD, University of Kansas, 2014
- Mills, Gary L.**, Adjunct Associate Professor, Environmental Engineering & Earth Sciences. BS, Southern Connecticut State University, 1975; PhD, University of Rhode Island, 1981
- Milsom, Amy S.**, Professor, Education & Human Development. BA, 1992, MEd, 1993, DEd, 2001, Pennsylvania State University
- Minor, John C.**, Senior Lecturer, General Engineering. BS, Rose-Hulman Institute of Technology, 1991; MS, Iowa State University, 1994
- Minor, V. Christine**, Senior Lecturer, Biological Sciences. BS, University of South Carolina-Upstate, 1991; MS, Iowa State University, 1997
- Misener Dunn, Kim M.**, Lecturer, Languages. BA, St Mary's University (Canada), 1990; MS, McDaniel College, 1997
- Mishra, Ashok**, Assistant Professor, Civil Engineering. BE, Utkal University (India), 1998; ME, Sambalpur University (India), 1999; PhD, Indian Institute of Technology (India), 2007
- Mitkovski, Mishko**, Assistant Professor, Mathematical Sciences. BS, Ss. Cyril and Methodius University (Macedonia), 2004; PhD, Texas A&M University, 2010
- Mityakov, Sergey V.**, Associate Professor, Economics. MS, Voronezh State University (Russia), 2001; MA, New Economic School (Russia), 2002; PhD, University of Chicago, 2008
- Mobley, F. Catherine**, Professor, Sociology. BA, Clemson University, 1984; MS, University of Bath (England), 1990; PhD, University of Maryland, 1996
- Mocko, Gregory**, Associate Professor, Mechanical Engineering. BS, University of Connecticut, 1999; MS, Oregon State University, 2001; PhD, Georgia Institute of Technology, 2006
- Moise, Edwin E.**, Professor, History. BA, Harvard University, 1967; MA, 1972, PhD, 1977, University of Michigan
- Monaghan, Amy N.**, Senior Lecturer, English. BA, Wellesley College, 1992; MA, University of Chicago, 1993; MA, New York University, 2005
- Monfort, Walter S.**, Adjunct Associate Professor, Agricultural & Environmental Sciences. BSA, 1998, MS, 2002, University of Georgia; PhD, University of Arkansas, 2005
- Montes, Heidi J.**, Lecturer, Languages. BA, Northern Illinois University, 1982; MA, University of South Carolina, 2008
- Montilla, Armando E.**, Assistant Professor, School of Architecture. BArch, University of Montreal (Canada), 1993; MArch, Pratt Institute, 1995; MA, Autonomous University of Barcelona (Spain), 2004
- Montjoy, Lindsey R.**, Lecturer, School of Nursing. BS, 2006, MS, 2012, Clemson University
- Moore Peralta, A.**, Research Assistant Professor, Institute on Family & Neighborhood Life. MD, Santiago University of Technology (Dominican Republic), 1990; MPH, Autonomous University of Santo Domingo (Dominican Republic), 1996; MED, Universidad Iberoamericana (Dominican Republic), 2006; PhD, Clemson University, 2011
- Moore, Clinton T.**, Adjunct Assistant Professor, Forestry & Environmental Conservation. BS, University of Georgia, 1982; MS, North Carolina State University, 1986; PhD, University of Georgia, 2002
- Moore, D. Dwayne**, Professor, Psychology. BA, North Texas State University, 1974; MA, 1977, PhD, 1979, Michigan State University
- Moore, Jesse N.**, Associate Professor, Marketing. BS, University of Richmond, 1981; MBA, 1991, MEd, 1992, Northern Arizona University; PhD, University of South Florida, 1997
- Moore, Kenneth W., III**, Senior Lecturer, Performing Arts. BA, Lander University, 2001
- Moore, Rachel A.**, Associate Professor, History. BA, Princeton University, 1998; MA, 2000, PhD, 2006, University of California
- Moore, Robert T.**, Senior Lecturer, Food, Nutrition, & Packaging Sciences. BA, Georgia State University, 1971
- Moran, Kristen B.**, Assistant Professor, Education & Human Development. BBA, College of William and Mary, 1998; MA, 2003, PhD, 2012, Virginia Tech
- Morey, Maribel**, Assistant Professor, History. BA, University of Notre Dame, 2003; JD, New York University, 2006; MA, 2008, PhD, 2013, Princeton University
- Morey, Sean W.**, Assistant Professor, English. BA, 2002, BA, 2003, MA, 2005, PhD, 2010, University of Florida
- Morgan, Angela G.**, Associate Professor, School of Accountancy & Finance. BS, Clemson University, 1993; MBA, 1994, PhD, 1999, University of Georgia
- Morgenstern, John D., Jr.**, Lecturer, Center for Electronic and Digital Publishing. BA, Middlebury College, 2003; DPhil, University of Oxford (England), 2011
- Morris, Eric A.**, Assistant Professor, Planning, Development, & Preservation. BA, Harvard University, 1989; MA, 2006, PhD, 2011, University of California-Los Angeles
- Morris, James C.**, Professor, Genetics & Biochemistry. BS, College of William and Mary, 1990; MS, 1993, PhD, 1997, University of Georgia
- Morris, Keith L.**, Professor, English. BA, 1992, MA, 1994, University of Idaho; MFA, University of North Carolina-Greensboro, 1996
- Morris, Meredith T.**, Assistant Professor, Genetics & Biochemistry. BS, Virginia Tech, 1994; PhD, University of Georgia, 2000
- Morrison, Deidra J.**, Adjunct Assistant Professor, Public Health. BS, Spelman College, 2002; MS, 2005, PhD, 2009, Northwestern University
- Morrissey, Lee J.**, Department Head and Professor, English. AB, Boston College, 1986; MA, 1988, MA, 1990, MPhil, 1992, PhD, 1995, Columbia University
- Morton, Richard T.**, Adjunct Associate Professor, Forestry & Environmental Conservation. BS, 1988, MFR, 1995, Clemson University
- Moss, Gregory S.**, Lecturer, Philosophy & Religion. BA, 2007, MA, 2007, PhD, 2014, University of Georgia
- Motes, Patricia S.**, Adjunct Professor, Institute on Family & Neighborhood Life. BS, South Carolina State University, 1976; PhD, University of South Carolina, 1986
- Mount, Andrew S.**, Research Associate Professor, Biological Sciences. BS, University of Tampa, 1980; MS, College of Charleston, 1991; PhD, Clemson University, 1999
- Moysey, Stephen M.**, Associate Professor, Environmental Engineering & Earth Sciences. BSc, University of Alberta (Canada), 1996; MS, University of Arizona, 1999; PhD, Stanford University, 2005
- Mroz, Thomas A.**, Adjunct Professor, Economics. AB, Vassar College, 1976; PhD, Stanford University, 1984
- Mubayi, Anuj**, Adjunct Assistant Professor, Mathematical Sciences. BSc, Kanpur University (India), 1997; MSc, Indian Institute of Technology (India), 2000; PhD, Arizona State University, 2008
- Mueller, John D.**, Academic Program Director, Edisto Research & Education Center; Professor, Agricultural & Environmental Sciences. BS, University of Missouri, 1978; MS, 1981, PhD, 1983, University of Illinois
- Muldrow, Ralph C.**, Adjunct Lecturer, Planning, Development, & Preservation. BA, 1984, BS, 1985, University of Virginia; MS, 1993, March, 1993, University of Pennsylvania
- Mullinax, James D.**, Professor, Military Leadership; Lieutenant Colonel, U.S. Army. BS, Clemson University, 1994; MMAS, Air University, 2010
- Mullins, Ryan R.**, Assistant Professor, Marketing. BS, 2005, MBA, 2008, Texas A&M University; PhD, University of Houston, 2012
- Murdoch, Lawrence C.**, Professor, Environmental Engineering & Earth Sciences. BS, Pennsylvania State University, 1980; MS, 1987, PhD, 1991, University of Cincinnati
- Murton, Catherine S.**, Senior Lecturer, School of Nursing. BS, 2005, MS, 2007, Clemson University
- Muth, Eric R.**, Interim Associate Dean of Research, College of Business & Behavioral Sciences. BA, Hartwick College, 1991; MS, 1993, PhD, 1997, Pennsylvania State University
- Myers, Oliver J.**, Associate Professor, Mechanical Engineering. BS, 1994, MS, 1996, PhD, 2007, University of Maryland-Baltimore County
- Nagatomi, Jiro**, Associate Professor, Bioengineering. BS, 1994, PhD, 2002, Rensselaer Polytechnic Institute
- Nagy, Sharon**, Vice Provost, Office of International Affairs. BA, University of California, 1983; PhD, University of Pennsylvania, 1997
- Naimou, Angela M.**, Assistant Professor, English. BA, University of Michigan, 2001; MA, 2004, PhD, 2009, Cornell University
- Nakuma, Constancio K.**, Associate Dean for Academic Affairs, College of Architecture, Arts & Humanities; Professor, Languages. BA, University of Ghana (Ghana), 1982; MA, University of Paris X-Nanterre (France), 1984; PhD, University of the New Sorbonne-Paris III (France), 1990; MBA, St Mary's University (Canada), 1991

- Nammouz, Minory**, Lecturer, *Environmental Engineering & Earth Sciences*. BA, Technion-Israel Institute of Technology (Israel), 1997; MEd, 2002, PhD, 2005, Clemson University
- Narayanan, Rajesh**, Adjunct Instructor, *Electrical & Computer Engineering*. BS, University of Madras (India), 1993; MS, 1998, MS, 1998, University of Texas-Arlington
- Nassar, Hala Fouad**, Associate Professor, *Landscape Architecture*. BS, 1988, MS, 1993, PhD, 1998, Ain Shams University (Egypt); MAg, Pennsylvania State University, 2000
- Nelson, Alfred T.**, Adjunct Professor, *Bioengineering*. BA, Princeton University, 1975; MD, Emory University, 1979
- Nelson, Eric A.**, Adjunct Professor, *Forestry & Environmental Conservation*. BA, Occidental College, 1971; MS, 1974, PhD, 1978, Oregon State University
- Nettles, William C., Jr.**, Adjunct Professor, *Agricultural & Environmental Sciences*. BS, 1955, MS, 1959, Clemson University; PhD, Rutgers University, 1962
- Neyens, David M.**, Assistant Professor, *Industrial Engineering*. BS, 2005, MS, 2006, MPH, 2008, PhD, 2010, University of Iowa
- Nghiem, Nhuan Phu**, Adjunct Professor, *Environmental Engineering & Earth Sciences*. BS, 1975, MS, 1977, University of New South Wales (Australia); PhD, Louisiana State University, 1982
- Nicholas, Joyce S.**, Adjunct Professor, *Bioengineering*. BA, Lenoir-Rhyne College, 1974; MS, Clemson University, 1983; MS, University of Tennessee, 1992; PhD, Medical University of South Carolina, 1997
- Nielson, Bryant G.**, Professor Of Practice, *Civil Engineering*. BS, 1998, MS, 2000, Utah State University; PhD, Georgia Institute of Technology, 2005
- Noneaker, Daniel L.**, Professor and Department Head, *Electrical & Computer Engineering*. BS, Auburn University, 1977; MS, Emory University, 1979; MS, Georgia Institute of Technology, 1984; PhD, University of Illinois, 1993
- Norfolk, Christopher W.**, Visiting Lecturer, *Chemical & Biomolecular Engineering*. BS, Clemson University, 2000; MS, 2003, PhD, 2005, University of Notre Dame
- Norman, William C.**, Professor, *Parks, Recreation & Tourism Management*. MS, Michigan State University, 1987; BS, 1980, PhD, 1995, University of Minnesota
- Norris, Kelly R.**, Assistant Professor, *Military Leadership; Captain, U.S. Army*. BS, South Carolina State University, 2004
- Nortcliff, Stephen**, Adjunct Professor, *Agricultural & Environmental Sciences*. BA, University of Bristol (England), 1969; PhD, University of East Anglia (England), 1974
- Northcutt, Julie K.**, Professor, *Food, Nutrition, & Packaging Sciences*. BS, 1987, MS, 1989, Clemson University; PhD, North Carolina State University, 1994
- Novick, Beth A.**, Senior Lecturer, *Mathematical Sciences*. BS, Barnard College, 1972; MS, University of Colorado, 1984; MS, 1987, PhD, 1990, Carnegie Mellon University
- Nycezipir, Andrew P.**, Adjunct Professor, *Agricultural & Environmental Sciences*. BSA, University of Georgia, 1974; MS, 1976, PhD, 1980, Clemson University
- Obeng, Yaw Samuel**, Adjunct Professor, *School of Materials Science & Engineering*. BSc, University of Science and Technology-Kumasi (Ghana), 1982; PhD, University of Miami, 1988; MBA, Rollins College, 1996
- Oberdan, Thomas J.**, Associate Professor, *College of Architecture, Arts & Humanities*. BA, University of Missouri-Saint Louis, 1972; AM, 1975, AM, 1976, PhD, 1990, Indiana University
- Oberheide, Jens**, Associate Professor, *Physics & Astronomy*. Diploma, University of Hanover (Germany), 1996; PhD, University of Wuppertal (Germany), 2000
- Ochterbeck, Jay M.**, Professor, *Mechanical Engineering*. BS, 1987, MS, 1990, PhD, 1993, Texas A&M University
- O'Connor, Sean**, Senior Lecturer, *Chemistry*. BS, Washington and Lee University, 1969; MS, University of South Carolina, 1978; PhD, Clemson University, 1990
- Ogale, Amod A.**, Professor, *Chemical & Biomolecular Engineering*. BT, Indian Institute of Technology (India), 1982; PhD, University of Delaware, 1986
- Ogle, Jennifer H.**, Associate Professor, *Civil Engineering*. BS, 1994, MS MS, 1996, University of Tennessee; PhD, Georgia Institute of Technology, 2005
- O'Hara, Liam H.**, Associate Professor, *Graphic Communications*. BA, University of Georgia, 1986; MAT, University of South Carolina, 1989; MInEd, 1997, EdD, 2005, Clemson University
- Okafor, Nduka**, Adjunct Professor, *Biological Sciences*. BSc, University of London (England), 1960; PhD, University of Cambridge (England), 1964
- Oliveira, Jaqueline**, Assistant Professor, *Economics*. BA, Federal University of Minas Gerais (Brazil), 2005; MS, University of Sao Paulo (Brazil), 2008; MA, 2010, MPhil, 2011, PhD, 2013, Yale University
- Olson, Laura R.**, Professor, *Political Science*. BA, Northwestern University, 1990; MA, 1991, PhD, 1996, University of Wisconsin
- Onori, Simona**, Assistant Professor, *Automotive Engineering*. BS, 2003, MS, 2003, PhD, 2007, University of Rome, Tor Vergata (Italy); MS, University of New Mexico, 2004
- Oropesa, Salvador A.**, Department Head and Professor, *Languages*. Lic, University of Granada (Spain), 1984; PhD, Arizona State University, 1990
- Orr, David E.**, Adjunct Assistant Professor, *Bioengineering*. BS, Rose-Hulman Institute of Technology, 1996; MBA, Purdue University, 2000; PhD, Clemson University, 2006
- Overbey, Lucas A.**, Adjunct Assistant Professor, *Mathematical Sciences*. Lic, Catholic University of America, 2003; MS, 2005, PhD, 2008, University of California-San Diego
- Overcamp, Thomas J.**, Professor, *Environmental Engineering & Earth Sciences*. BS, Michigan State University, 1968; MS, 1970, PhD, 1973, Massachusetts Institute of Technology; PE
- Owens, Jeffery R.**, Adjunct Professor, *School of Materials Science & Engineering*. BS, 1996, BS, 1997, Fort Hays State University; PhD, Auburn University, 2007
- Owino, Tom O.**, Associate Professor, *Environmental Engineering & Earth Sciences*. BS, University of Nairobi (Kenya), 1985; MS, University of Alberta (Canada), 1993; PhD, Pennsylvania State University, 1999
- Pace, Thomas B.**, Adjunct Professor, *Bioengineering*. BS, Mississippi State University, 1978; MD, University of Mississippi School of Medicine, 1982
- Padgett, William J.**, Adjunct Professor, *Mathematical Sciences*. BS, 1966, MS, 1968, Clemson University; PhD, Virginia Tech, 1971
- Padua, Mary G.**, Department Chair and Professor, *Landscape Architecture*. BA, University of California, 1978; MA, University of California-Los Angeles, 1984; PhD, University of Edinburgh (Scotland), 2011
- Pagano, Christopher C.**, Professor, *Psychology*. BA, 1987, PhD, 1993, University of Connecticut
- Pak, Chong Hyon**, Associate Professor, *Psychology*. BS, 1997, MS, 2001, PhD, 2005, Georgia Institute of Technology
- Palacios, George**, Assistant Professor, *Languages*. BA, Corporacion Universitaria Lasallista (Colombia), 2000; MA, Purdue University, 2004; PhD, University of Pittsburgh, 2013
- Palmer, R. Barton**, Calhoun Lemon Professor of Literature, *English*. BA, Dartmouth College, 1968; BA, University of Durham (Scotland), 1970; MPhil, 1972, PhD, 1974, Yale University; MA, 1984, PhD, 1989, New York University
- Pang, Weichiang**, Associate Professor, *Civil Engineering*. BSc, 2001, MSc, 2001, PhD, 2005, Michigan Technological University
- Pargas, Roy P.**, Associate Professor, *School of Computing*. BS, Ateneo De Manila University (Philippines), 1971; MS, 1981, PhD, 1982, University of North Carolina
- Parisi, Michelle A.**, Adjunct Assistant Professor, *Food, Nutrition, & Packaging Sciences*. BS, Eastern Illinois University, 1993; MS, Rush University, 1999; PhD, Clemson University, 2012
- Park, Chanseok**, Associate Professor, *Mathematical Sciences*. BS, Seoul National University (Korea), 1987; MS, Korea Advanced Institute of Science and Technology (Korea), 1989; MA, University of Texas, 1994; PhD, Pennsylvania State University, 2000
- Park, Dara M.**, Assistant Professor, *Agricultural & Environmental Sciences*. BS, 1997, MS, 2001, Florida Atlantic University; PhD, University of Florida, 2006
- Park, Hyun J.**, Adjunct Associate Professor, *Food, Nutrition, & Packaging Sciences*. BS, 1983, MS, 1985, Korea University (Korea); PhD, University of Georgia, 1991
- Park, William J., Jr.**, Associate Professor, *General Engineering*. BS, 1978, MS, 1981, PhD, 1986, Clemson University
- Parker, Veronica G.**, Professor, *School of Nursing*. BS, College of Charleston, 1984; BS, Clemson University, 1986; PhD, Medical University of South Carolina, 1994
- Parnell, Ashley W.**, Lecturer, *Management*. BS, Lander University, 2006; MBA, Anderson College, 2013
- Parr, Boyd H.**, Director, *Animal Health Programs; Adjunct Professor, Animal & Veterinary Sciences*. BS, Clemson University, 1974; DVM, University of Georgia, 1978
- Parrott, Timothy F.**, Lecturer, *Mathematical Sciences*. BS, 1998, MS, 1998, Clemson University
- Parsons, Linda M.**, Adjunct Assistant Professor, *Biological Sciences*. BS, Hartwick College, 1965; MS, College of Saint Rose, 1980; PhD, State University of New York-Albany, 1995
- Pastre, David A.**, Senior Lecturer, *School of Architecture*. BA, Miami University, 1998; MArch, Clemson University, 2005
- Paul, Kimberly S.**, Associate Professor, *Genetics & Biochemistry*. BA, Northwestern University, 1991; PhD, Princeton University, 1998
- Pavan, Enrique**, Adjunct Professor, *Animal & Veterinary Sciences*. BS, 1996, MSc, 2000, National University of La Plata (Argentina); PhD, University of Georgia, 2006
- Peake, Jeffrey S.**, Department Head and Professor, *Political Science*. BA, Clemson University, 1992; PhD, Texas A&M University, 1999
- Pearce, Colin**, Lecturer, *Clemson Institute for the Study of Capitalism*. BEd, 1971, MA, 1974, PhD, 1986, University of Toronto (Canada)
- Pearl, Gary G.**, Adjunct Professor, *Animal & Veterinary Sciences; Adjunct Assistant Professor, Food, Nutrition, & Packaging Sciences*. BS, 1959, DVM, 1963, Purdue University
- Pearse, Suzanne**, Lecturer, *School of Accountancy & Finance*. BS, 1970, MAcc, 1990, University of South Florida; CPA (South Carolina)
- Peebles, Kelly D.**, Assistant Professor, *Languages*. BA, Randolph-Macon Woman's College, 1999; MA, University of South Carolina, 2001; PhD, University of Georgia, 2010
- Peeler, David K.**, Adjunct Assistant Professor, *School of Materials Science & Engineering*. MS, Alfred University, 1989; BS, 1987, PhD, 1993, Clemson University
- Pellegrini, Vincent D., Jr.**, Adjunct Faculty, *Bioengineering*. BA, 1976, MD, 1979, Dartmouth College
- Pelt, April S.**, Lecturer, *English*. BA, Winthrop University, 2006; MA, University of Delaware, 2008
- Peng, Fei**, Assistant Professor, *School of Materials Science & Engineering*. BEng, 2000, MEng, 2005, Tsinghua University (China); PhD, Georgia Institute of Technology, 2008
- Peng, Xiangu**, Adjunct Professor, *Bioengineering*. BS, 1982, MS, 1984, PhD, 1989, Tianjin University (China)
- Peniston, Shawn J.**, Adjunct Assistant Professor, *Bioengineering*. BS, University of Wisconsin-Platteville, 1994; MS, University of Massachusetts-Lowell, 2004; PhD, Clemson University, 2010
- Penna, Anthony M.**, Associate Professor, *Performing Arts*. BA, Hanover College, 1993; MFA, Boston University, 2000
- Pennington, William T., Jr.**, Alumni Professor, *Chemistry*. BA, Hendrix College, 1977; PhD, University of Arkansas, 1983
- Perahia, Dvora**, Professor, *Chemistry*. BSc, Hebrew University of Jerusalem (Israel), 1981; MSc, 1984, PhD, 1990, Weizmann Institute of Science (Israel)
- Perpich, Diane**, Associate Professor, *Philosophy & Religion*. BA, Bryn Mawr College, 1984; MA, 1987, PhD, 1997, University of Chicago
- Perry, Travis W.**, Adjunct Assistant Professor, *Forestry & Environmental Conservation*. BS, Furman University, 1992; PhD, University of New Mexico, 2001
- Persico, Melva M.**, Lecturer, *Languages*. BA, 1986, MA, Illinois State University, 1993; PhD, University of Miami, 2011
- Petersen, George J.**, Dean, *School Of Education*. BA, Pontifical University of Saint Thomas Aquinas (Italy) Pontifical University of Saint Thomas Aquinas (Italy), 1981; BA, 1986, MA, 1991, PhD, 1993, University of California-Santa Barbara
- Peterson, James K.**, Associate Professor, *Mathematical Sciences*. BA, Indiana University, 1975; MS, 1977, PhD, 1980, Colorado State University
- Peterson, Paul D.**, Adjunct Assistant Professor, *Agricultural & Environmental Sciences*. BA, 1985, MA, 1991, PhD, 2003, North Carolina State University
- Pettigrew, Charles A., Jr.**, Adjunct Associate Professor, *Biological Sciences*. BS, Erskine College, 1981; MS, Clemson University, 1984; PhD, University of Tennessee, 1988
- Petty, Jeffrey T.**, Adjunct Professor, *Chemistry*. BS, Furman University, 1986; PhD, University of California, 1993
- Pickett, Gregory M.**, Associate Dean, *College of Business & Behavioral Sciences; Professor, Marketing*. BS, 1979, MBA, 1983, PhD, 1985, Oklahoma State University
- Pilcher, June J.**, Alumni Professor, *Psychology*. BA, University of Southern Mississippi, 1984; MA, 1989, PhD, 1989, University of Chicago

- Pilla, Srikanth**, Assistant Professor, Automotive Engineering. BTech, Jawaharlal Nehru Technological University (India), 2002; MS, University of Toledo, 2005; PhD, University of Wisconsin-Milwaukee, 2009
- Piper, Christine A.**, Professor, Construction Science & Management. BS, 1986, MCSM, 1988, Clemson University; PhD, University of South Australia (Australia), 2007
- Piratala, Kalyan R.**, Assistant Professor, Civil Engineering. BS, 2008, MS, 2008, Indian Institute of Technology Madras (India); PhD, Arizona State University, 2012
- Pisano, Etta D.**, Adjunct Professor, Bioengineering. BA, Dartmouth College, 1979; MD, Duke University, 1983
- Piskin, Serghei**, Adjunct Professor, School of Materials Science & Engineering. PhD, Moldova State University (Moldova), 1967; DSc, Moscow State University (Russia), 1978
- Pisu, Pierluigi**, Associate Professor, Automotive Engineering. MS, University of Genoa (Italy), 1996; PhD, Ohio State University-Columbus, 2002
- Pitt, Amber L.**, Adjunct Assistant Professor, Forestry & Environmental Conservation. BA, University of Vermont, 1997; MS, 2005, PhD, 2008, University of Florida
- Plastina, Alejandro S.**, Adjunct Faculty, Policy Studies. BA, 2000, MA, 2001, National University of La Plata (Argentina); MS, 2005, PhD, 2007, University of Nebraska
- Plumlee II, Jeffrey M.**, Adjunct Assistant Professor, Civil Engineering. BS, 2008, MS, 2009, MBA, 2013, PhD, 2013, Clemson University
- Plummer, Lawrence A.**, Adjunct Faculty, Policy Studies. BS, Syracuse University, 1992; MA, George Washington University, 1999; PhD, University of Colorado-Denver, 2007
- Podila, Ramakrishna**, Assistant Professor, Physics & Astronomy. BS, Sri Sathya Sai Institute Higher Learning (India), 2005; MS, Indian Institute of Technology (India), 2007; PhD, Clemson University, 2011
- Poehlman, Thomas A.**, Assistant Professor, Marketing. BS, University of Washington, 2003; MS, 2005, MPhil, 2005, PhD, 2007, Yale University
- Pometto, Anthony L., III**, Professor, Food, Nutrition, & Packaging Sciences. BS, George Mason University, 1976; MS, 1983, PhD, 1987, University of Idaho
- Pope, Amy L.**, Senior Lecturer, Physics & Astronomy. BS, 1997, MS, 1999, PhD, 2002, Clemson University
- Porcher, Richard D.**, Adjunct Professor, Biological Sciences. BS, College of Charleston, 1962; MS, 1966, PhD, 1974, University of South Carolina
- Pordomingo, Anibal J.**, Adjunct Professor, Animal & Veterinary Sciences. BS, National University of La Pampa (Argentina), 1986; MS, 1989, PhD, 1990, New Mexico State University
- Porter, Marissa S.**, Assistant Professor, Psychology. BA, Pfeiffer University, 2004; MA, George Mason University, 2006; PhD, University of Central Florida, 2013
- Porter, Michael M.**, Assistant Professor, Mechanical Engineering. BS, Virginia Military Institute, 2007; MS, University of Hawaii, 2010; PhD, University of California-San Diego, 2014; BS
- Post, Christopher J.**, Associate Professor, Forestry & Environmental Conservation. BS, Reed College, 1990; MS, 1995, PhD, 2001, Cornell University
- Powell, Brian A.**, Associate Professor, Environmental Engineering & Earth Sciences. BS, University of Montevallo, 1999; MS, 2001, PhD, 2004, Clemson University
- Powell, Elizabeth E.**, Assistant Professor, Management. BS, 2002, MS, 2004, PhD, 2011, North Carolina State University
- Powell, Gwynn M.**, Associate Professor, Parks, Recreation & Tourism Management. BA, Mercer University, 1985; MS, Indiana University, 1986; PhD, Clemson University, 2001
- Powell, Robert B.**, Associate Professor, Parks, Recreation & Tourism Management. BA, University of North Carolina, 1983; MS, 2001, PhD, 2005, Yale University
- Powers, Alicia**, Adjunct Associate Professor, Food, Nutrition, & Packaging Sciences. BS, 2002, MS, 2004, Auburn University; PhD, University of Southern Mississippi, 2007
- Powers, Matthew N.**, Associate Professor, Landscape Architecture. BSLA, West Virginia University, 1996; MLA, 2000, PhD, 2006, Virginia Tech
- Poznanovikj, Svetlana**, Assistant Professor, Mathematical Sciences. BS, Ss. Cyril and Methodius University (Macedonia), 2004; PhD, Texas A&M University, 2010
- Pratt, Angela N.**, Assistant Professor, Communication Studies. BA, Campbell University, 1998; MA, University of North Carolina, 2000; PhD, University of Tennessee, 2010
- Pratt, Scott L.**, Associate Professor, Animal & Veterinary Sciences. BS, West Virginia University, 1985; MS, Clemson University, 1989; PhD, University of Missouri, 1994
- Preston, Caroline M.**, Adjunct Associate Professor, Agricultural & Environmental Sciences. BSc, McMaster University, 1970; PhD, University of British Columbia (Canada), 1975; MA, Carleton University (Canada), 1986
- Prevost, Shari A.**, Senior Lecturer, Mathematical Sciences. BS, University of Florida, 1982; PhD, Rutgers University, 1989
- Price, Vaneaton, Jr.**, Adjunct Associate Professor, Environmental Engineering & Earth Sciences. BS, University of South Carolina, 1962; MS, 1967, PhD, 1969, University of North Carolina
- Privette, Charles V., III**, Associate Professor, Agricultural & Environmental Sciences. BS, 1997, MS, 1998, Clemson University; PhD, University of South Carolina, 2005; PE
- Prucka, Robert G.**, Assistant Professor, Automotive Engineering. BS, 2000, MS, 2004, PhD, 2008, University of Michigan
- Pruitt, Rosanne H.**, Professor, School of Nursing. BSN, Emory University, 1974; MN, University of South Carolina, 1979; PhD, University of Maryland, 1989
- Ptacek, Margaret**, Professor, Biological Sciences. BS, 1981, MS, 1984, Emporia State University; PhD, University of Missouri, 1991
- Pugh, Marilyn D.**, Lecturer, Communication Studies. BA, Eastern Illinois University, 2011; MA, Ball State University, 2013
- Pulley, William M.**, Senior Lecturer, English. BA, 1985, MA, 2006, California State University-Sacramento
- Puneet, Pooja**, Lecturer, Physics & Astronomy. BS, Chhatrapati Shahu Ji Maharaj University (India), 2005; MS, Indian Institute of Technology Roorkee (India), 2007; PhD, Clemson University, 2013
- Pursley, John L., III**, Lecturer, English. BA, University of Missouri, 1999; MFA, University of Alabama, 2003
- Pursley, Michael B.**, Holcombe Professor, Electrical & Computer Engineering. BS, 1967, MS, 1968, Purdue University; PhD, University of Southern California, 1974
- Purves, J Todd**, Adjunct Assistant Professor, Bioengineering. AB, Cornell University, 1991; PhD, 1998, MD, 2000, University of Illinois
- Purvis, Russell L.**, Associate Professor, Management. BS, University of Miami, 1980; MBA, Georgia State University, 1985; PhD, Florida State University, 1994
- Pury, Cynthia L. S.**, Professor, Psychology. BA, University of Wisconsin, 1989; MS, 1991, PhD, 1997, Northwestern University
- Putman, Bradley J.**, Associate Professor, Civil Engineering. BS, 1998, MS, 2000, PhD, 2005, Clemson University
- Pye, Angela K.**, Senior Lecturer, School of Nursing. BS, 1996, MS, 2005, Clemson University
- Pyle, Andrew S.**, Assistant Professor, Communication Studies. BA, Ouachita Baptist University, 2009; MA, University of Arkansas, 2011; PhD, George Mason University, 2014
- Qian, Meihua**, Assistant Professor, Education & Human Development. BA, Qufu Normal University (China), 2002; MA, Beijing Normal University (China), 2006; PhD, Indiana University, 2014
- Qian, Zhen**, Adjunct Assistant Professor, Civil Engineering. BS, 2004, MS, 2006, Tsinghua University (China); MS, Stanford University, 2012; PhD, University of California-Davis, 2011
- Qiao, Rui**, Adjunct Associate Professor, Mechanical Engineering. BS, Huazhong University of Science and Technology -Wuhan (China), 1996; MS, Tsinghua University (China), 1999; PhD, University of Illinois, 2004
- Quigley, Cassie F.**, Assistant Professor, Teaching & Learning. BS, Indiana University, 2000; MS, Indiana University-Purdue University-Indianapolis, 2002; PhD, Indiana University, 2010
- Quinn, William H.**, Professor, Youth Development Programs. BS, State University of New York-Oswego, 1970; MS, University of Oregon, 1974; PhD, Virginia Tech, 1980
- Radtke, Robin R.**, Assistant Professor, School of Accountancy & Finance. BS, Marquette University, 1984; PhD, University of Florida, 1992
- Rahn, Christopher D.**, Adjunct Associate Professor, Electrical & Computer Engineering. BS, University of Michigan, 1985; MS, 1986, PhD, 1992, University of California
- Rall, Douglas F.**, Adjunct Professor, Mathematical Sciences. BA, 1971, MS, 1972, PhD, 1976, University of Iowa
- Raman, Roopa**, Assistant Professor, Management. BSc, 1993, MSc, 1995, University of Calcutta (India); MS, University of California-Los Angeles, 2000; MBA, University of South Carolina, 2002; PhD, Emory University, 2008
- Ramasubramanian, M. K.**, Department Head and DW Reynolds Distinguished Professor, Mechanical Engineering. BS, National Institute of Technology Durgapur (India), 1981; MS, Miami University, 1983; PhD, Syracuse University, 1987
- Ramirez, Barbara J.**, Senior Lecturer, English. BA, 1979, MA, 1982, Clemson University
- Ramshaw, Gregory P.**, Assistant Professor, Parks, Recreation & Tourism Management. MA, University of Newcastle Upon Tyne (England), 2001; BA, 1997, PhD, 2009, University of Alberta (Canada)
- Randall, Philip D.**, Senior Lecturer, English. BJ, University of Missouri, 1978; MA, Clemson University, 2004
- Rangaraju, Prasada R.**, Associate Professor, Civil Engineering. BTech, Jawaharlal Nehru Technological University (India), 1991; MS, Iowa State University, 1993; PhD, Purdue University, 1997
- Ranney, Thomas G.**, Adjunct Faculty, Forestry & Environmental Conservation. BS, Ohio State University, 1981; MS, 1986, PhD, 1989, Cornell University
- Ransom, Bruce W., II**, Professor, Political Science. BA, Hampton Institute, 1971; MA, 1974, PhD, 1981, University of Virginia
- Rao, Apparao M.**, Professor, Physics & Astronomy. BS, University of Mumbai (India), 1983; MS, 1985, PhD, 1989, University of Kentucky
- Rapaka, Vijaya K.**, Adjunct Assistant Professor, Agricultural & Environmental Sciences. BS, A N G R Agriculture University (India), 1998; MS, Indian Agricultural Research Inst (India), 2000; PhD, University of Hanover (Germany), 2004
- Ravichandran, Nadarajah**, Associate Professor, Civil Engineering. BS, University of Peradeniya (Sri Lanka), 1997; MEng, University of Tokyo (Japan), 2000; PhD, University of Oklahoma, 2005
- Ray, Christopher L.**, Director, Agricultural Research. BS, 1994, MS, 1997, PhD, 2005, Clemson University
- Raymark, Patrick H.**, Department Head and Professor, Psychology. BS, University of Wisconsin-Oshkosh, 1987; MS, Illinois State University, 1989; PhD, Bowling Green State University, 1993
- Raymond, Mary Anne**, Department Head and Professor, Marketing. BS, 1976, MBA, 1978, University of Alabama; PhD, University of Georgia, 1986
- Reay-Jones, Francis P.**, Associate Professor, Agricultural & Environmental Sciences. BS, Universite Bordeaux I (France), 1999; MS, University of Angers (France), 2001; PhD, Louisiana State University, 2005
- Reba, Marilyn**, Senior Lecturer, Mathematical Sciences. BA, Cleveland State University, 1968; MA, 1970, PhD, 1973, University of North Carolina; MS, Purdue University, 1996
- Rebholz, Leo G.**, Associate Professor, Mathematical Sciences. BS, 2000, MA, 2002, Duquesne University; MA, 2003, PhD, 2006, University of Pittsburgh
- Reboul, Scott H.**, Adjunct Assistant Professor, Environmental Engineering & Earth Sciences. BS, Dickinson College, 1979; MS, 1984, PhD, 1993, Clemson University
- Redd, Rena T.**, Assistant Librarian, University Libraries. BA, University of Georgia, 2003; MA, University of Mississippi, 2006; MLIS, University of South Carolina, 2007
- Reed, Thomas D.**, Adjunct Professor, Agricultural & Environmental Sciences. BS, 1984, MS, 1987, PhD, 1990, Virginia Tech
- Reid, William J., III**, Visiting Associate Professor, Electrical & Computer Engineering. BS, 1988, MS, 1990, PhD, 1997, Clemson University
- Reighard, Gregory L.**, Professor, Agricultural & Environmental Sciences. BS, Pennsylvania State University, 1977; MS, University of Michigan, 1978; PhD, Michigan State University, 1984
- Reimels, Elaine C.**, Adjunct Assistant Professor, School of Nursing. BS, 1968, MS, 1976, University of Rhode Island; PhD, University of South Carolina, 1990
- Reina-Nunnelley, Anita M.**, Lecturer, PRTM Leisure Skills. BS, Clemson University, 2010
- Reinking, David P.**, Eugene T. Moore Professor, Education & Human Development. BA, Concordia Teachers College, 1971; MS, Winona State University, 1979; PhD, University of Minnesota, 1983
- Remy, Sekou L.**, Assistant Professor, School of Computing. BS, Morehouse College, 2002; BS, 2002, MS, 2004, PhD, 2009, Georgia Institute of Technology

- Reukov, Vladimir V.**, *Research Assistant Professor, Bioengineering*. BS, 2001, MS, 2003, PhD, 2006, Moscow State University (Russia)
- Reynolds, Elizabeth P.**, *Lecturer, Educational & Organizational Leadership Development*. BA, 1974, MEd, 1983, EdS, 1986, PhD, 1990, University of South Carolina
- Rhew, Robert C.**, *Adjunct Associate Professor, Forestry & Environmental Conservation*. BA, Harvard University, 1992; PhD, University of California-San Diego, 2001
- Rhodehamel, E. J.**, *Department Head and Professor, Food, Nutrition, & Packaging Sciences*. BS, 1979, MS, 1983, PhD, 1996, Virginia Tech
- Rice, Charles D.**, *Professor, Biological Sciences*. BS, 1980, MS, 1986, Virginia Commonwealth University; PhD, College of William and Mary, 1989
- Richards, Vincent P.**, *Assistant Professor, Biological Sciences*. BS, 2001, MSc, 2006, PhD, 2010, Nova Southeastern University
- Rieck, James R.**, *Professor, Mathematical Sciences*. BS, Salisbury State University, 1974; MS, 1978, PhD, 1989, Clemson University
- Rigas, Nikolaos**, *Adjunct Professor, Chemical & Biomolecular Engineering; Adjunct Professor, Environmental Engineering & Earth Sciences*. BS, University of Missouri-Rolla, 1984; MS, Kansas State University, 1988; DSc, Washington University, 1991
- Riggs, Robert J.**, *Visiting Lecturer, Industrial Engineering*. BS, Kettering University, 2008; MS, University of Michigan, 2011
- Riggs, Sara L.**, *Assistant Professor, Industrial Engineering*. BA, 2009, BS, 2009, Virginia Tech; MSE, 2011, PhD, 2014, University of Michigan
- Ring, Gail D.**, *Director of the ePortfolio Program, Office of Undergraduate Studies*. BA, 1994, MEd, 1997, PhD, 2002, University of Florida
- Rios-Adams, Minerva**, *Senior Lecturer, Mathematical Sciences*. BS, University of Puerto Rico-Humacao, 1978; MS, Virginia Tech, 1982
- Rivera, Gabriel**, *Adjunct Assistant Professor, Biological Sciences*. BS, 2000, MS, 2003, Old Dominion University; PhD, Clemson University, 2009
- Rivlin, Elizabeth J.**, *Associate Professor, English*. AB, Vassar College, 1992; MA, 1997, PhD, 2003, University of Wisconsin
- Robbins, Tina L.**, *Associate Professor, Management*. BS, Clemson University, 1981; MBA, Winthrop University, 1986; PhD, University of South Carolina, 1991
- Robert, Shannon T.**, *Associate Professor, Performing Arts*. BA, 1989, BFA, 1989, William Carey College; MFA, Florida State University, 1992
- Roberts, Aaron P.**, *Adjunct Assistant Professor, Biological Sciences*. BS, University of Missouri, 1999; MS, 2001, PhD, 2005, Miami University
- Roberts, Mark E.**, *Assistant Professor, Chemical & Biomolecular Engineering*. BS, Montana State University-Bozeman, 2002; MS, 2005, PhD, 2009, Stanford University
- Roberts, Phillip M.**, *Adjunct Professor, Agricultural & Environmental Sciences*. BS, 1988, PhD, 1993, University of Georgia
- Robinson, Kathleen K.**, *Adjunct Faculty, Institute on Family & Neighborhood Life*. BA, Moody Bible College, 1970; MEd, Texas Woman's University, 1970; PhD, Michigan State University, 1978
- Robinson, Kenneth L.**, *Associate Professor, Rural Sociology*. BS, Clemson University, 1984; MPA, University of Texas, 1988; PhD, Cornell College, 2001
- Robison, Cathy A.**, *Senior Lecturer, Languages*. BA, Lawrence University, 1980; MA, Southern Illinois University, 1983; MA, University of Georgia, 1996
- Rock, Edward J.**, *Associate Librarian, University Libraries*. BA, University of Miami, 1989; MA, University of California-Santa Barbara, 1998; MS, University of North Texas, 1998
- Rodgers, John H., Jr.**, *Professor, Forestry & Environmental Conservation*. BS, 1972, MS, 1974, Clemson University; PhD, Virginia Tech, 1977
- Rodriguez, Jorge I.**, *Research Assistant Professor, Bioengineering*. BS, Instituto Tecnológico de Ciudad Juárez (Mexico), 2005; MSc, 2010, PhD, 2013, University of Texas-El Paso
- Rodriguez, Shari L.**, *Lecturer, Forestry & Environmental Conservation*. BA, Whitman College, 1993; MA, School For International Training, 2007; PhD, North Carolina State University, 2012
- Rogers, Angela**, *Lecturer, Teaching & Learning*. BA, 1993, MA, 2002, PhD, 2010, Clemson University
- Rogers, Richard C.**, *Adjunct Faculty, Genetics & Biochemistry*. BS, Clemson University, 1975; MD, Medical University of South Carolina, 1980
- Rojas-de-Massei, Monica M.**, *Associate Professor, Languages*. BA, National University of Cordoba (Argentina), 1989; MA, 1993, PhD, 1999, University of Iowa
- Roldan, Miguel**, *Adjunct Professor, School of Architecture*. BArch, Universitat Politècnica de Catalunya (Spain), 1988
- Romansky, Beverly L.**, *Lecturer, Education & Human Development*. BA, 1972, MEd, 1974, Clemson University
- Rose, Patrick G.**, *Senior Lecturer, Graphic Communications*. BA, Virginia Tech, 1972; MInEd, Clemson University, 1990
- Rosenblith, Suzanne N.**, *Department Head and Professor, Teaching & Learning*. BA, Muhlenberg College, 1991; MS, Minnesota State University-Mankato, 1995; PhD, University of Wisconsin, 2001
- Rosopa, Patrick J.**, *Associate Professor, Psychology*. BS, Tulane University, 2000; MS, 2003, PhD, 2006, University of Central Florida
- Ross, Brandon E.**, *Assistant Professor, Civil Engineering*. BS, 2001, MS, 2002, University of Wyoming; PhD, University of Florida, 2012
- Roth, Aleda M.**, *Burlington Industries Professor of Supply Chain Management, Management*. MSPH, University of North Carolina, 1970; BS, 1968, PhD, 1986, Ohio State University
- Roth, Philip L.**, *Professor, Management*. BA, University of Tennessee, 1981; MA, 1985, PhD, 1988, University of Houston
- Rozetar, Robert W., III**, *Assistant Professor, Military Leadership; Major, U.S. Army*. BS, Clemson University, 1998
- Rudolph, Krista B.**, *Senior Lecturer, Biological Sciences*. MEd, Charleston Southern University, 1992; BS, 1990, PhD, 2002, Clemson University
- Ruhl, Stephanie M.**, *Assistant Professor, Communication Studies*. BA, Spring Arbor University, 2006; MA, Western Michigan University, 2010; PhD, Ohio University, 2014
- Russell, Harlan B.**, *Associate Professor, Electrical & Computer Engineering*. BS, 1986, MS, 1989, PhD, 1993, University of Illinois
- Russell, Paul C.**, *Assistant Professor, Landscape Architecture*. BS, University of Tennessee, 2001; MLA, Louisiana State University, 2005
- Ryan, Adam C.**, *Adjunct Assistant Professor, Biological Sciences*. BS, State University of New York-Fredonia, 1999; MS, 2001, PhD, 2005, Clemson University
- Ryan, Christine E.**, *Associate Librarian, University Libraries*. BS, Baldwin-Wallace College, 1974; MS, University of Kentucky, 2000
- Ryan, Joseph B.**, *Professor, Teacher Education*. BS, University of Arizona, 1984; MBA, University of West Florida, 1992; MEd, Old Dominion University, 1995; PhD, University of Nebraska, 2004
- Ryan, Michael F.**, *Adjunct Professor, Agricultural & Environmental Sciences*. BSc, University College Dublin (Ireland), 1963; PhD, University of London - Rothamsted Station (England), 1967
- Sachs, Barton L.**, *Adjunct Professor, Bioengineering*. BA, Harvard University, 1973; MD, State University of New York-Upstate Medical University, 1977; MBA, Rensselaer Polytechnic Institute, 1998
- Sackett, Corrine R.**, *Assistant Professor, Education & Human Development*. BS, 1999, MA, 2003, Appalachian State University; PhD, Virginia Tech, 2011
- Safro, Ilya Mark**, *Assistant Professor, School of Computing*. BSc, Ben Gurion University of The Negev (Israel), 1998; MSc, 2003, PhD, 2008, Weizmann Institute of Science (Israel)
- Saif, Mashal**, *Assistant Professor, Philosophy & Religion*. BA, Macalester College, 2006; MA, 2010, PhD, 2014, Duke University
- Saltzman, Matthew J.**, *Associate Professor, Mathematical Sciences*. BA, Cornell University, 1977; MS, 1982, PhD, 1986, Carnegie Mellon University
- Sampson, David B.**, *Adjunct Professor, Forestry & Environmental Conservation*. BA, Stanford University, 1975; MS, University of Washington, 1984; PhD, University of London (England), 1989
- Samuelson, Mark**, *Assistant Professor, Military Leadership*. BS, Central Michigan University, 2010
- Sanabria, Hugo**, *Assistant Professor, Physics & Astronomy*. BS, Monterrey Institute of Technology (Mexico), 1999; MS, 2002, PhD, 2005, University of Houston
- Sanborn, Sarah M.**, *Lecturer, Psychology*. BA, 2004, MA, 2010, University of Connecticut
- Sanders, Felicia J.**, *Adjunct Assistant Professor, Forestry & Environmental Conservation*. BS, Duke University, 1987; MS, Clemson University, 2000
- Sanders, Steve R.**, *Adjunct Associate Professor, Industrial Engineering*. BS, United States Military Academy, 1978; MS, Auburn University, 1987; PhD, Pennsylvania State University, 1989
- Sanderson, James W., Jr.**, *Assistant Professor, Communication Studies*. BA, 2006, MA, 2008, Arizona State University West; PhD, Arizona State University, 2012
- Sarasua, Wayne A.**, *Associate Professor, Civil Engineering*. BS, University of California, 1984; MS, 1989, PhD, 1992, Georgia Institute of Technology
- Sarupria, Sapna**, *Assistant Professor, Chemical & Biomolecular Engineering*. BT, Chaitanya Bharati Institute of Technology (India), 2002; ME, Texas A&M University, 2004; PhD, Rensselaer Polytechnic Institute, 2009
- Saski, Christopher A.**, *Research Assistant Professor, CU Genomics Institute*. BS, 1999, PhD, 2007, Clemson University
- Satoh, Junichi**, *Lecturer, School of Architecture*. BFA, 1994, MArch, 2005, Rhode Island School of Design
- Satris, Stephen A.**, *Associate Professor, Philosophy & Religion*. BA, University of California-Los Angeles, 1969; MA, University of Hawaii, 1971; PhD, University of Cambridge (England), 1984
- Satterfield, James W.**, *Associate Professor, Educational & Organizational Leadership Development*. BS, 1993, MA, 1995, Norfolk State University; EdD, Eastern Michigan University, 2002
- Sauer, Raymond D., Jr.**, *Department Head and Professor, Economics*. BA, 1979, MA, 1981, University of New Mexico; PhD, University of Washington, 1985
- Saunders, Richard L., Jr.**, *Professor, History*. BA, Northwestern University, 1962; MA, 1964, PhD, 1971, University of Illinois
- Savedra, Adam R.**, *Senior Lecturer, Parks, Recreation & Tourism Management*. BBA, 1999, MBA, 2001, New Mexico State University
- Sawyer, Amy Lyn G.**, *Senior Lecturer, Languages*. BA, Winthrop University, 1996; MA, University of Georgia, 1999
- Sawyer, Calvin B.**, *Assistant Professor, Agricultural & Environmental Sciences*. BA, Wake Forest University, 1987; MS, Oregon State University, 1995; PhD, Clemson University, 2009
- Saylor, John R.**, *Professor, Mechanical Engineering*. BS, State University of New York-Buffalo, 1986; MS, University of Minnesota, 1989; MPhil, 1993, PhD, 1993, Yale University
- Schaefer, John J.**, *Adjunct Faculty, School of Nursing*. BA, 1981, BS, 1983, MD, 1988, West Virginia University
- Schalkoff, Robert J.**, *Professor, Electrical & Computer Engineering*. MEng, Rensselaer Polytechnic Institute, 1976; BS, 1975, PhD, 1979, University of Virginia
- Scharko, Patricia B.**, *Professor, Animal Health Programs*. BS, 1980, DVM, 1983, University of Georgia
- Schilf, Suzanne R.**, *Associate Librarian, University Libraries*. BA, Clemson University, 1993; MLS, University of Alabama, 1994
- Schilleman, Matthew L.**, *Visiting Assistant Professor, English*. BA, Michigan State University, 2005; MA, 2007, PhD, 2012, University of California-Irvine
- Schlahtman, Mark A.**, *Professor, Environmental Engineering & Earth Sciences*. BS, University of Nebraska, 1984; MS, 1987, PhD, 1992, California Institute of Technology
- Schleifer, Lydia L.**, *Associate Professor, School of Accountancy & Finance*. BA, Davidson College, 1977; PhD, University of Georgia, 1988
- Schmalz, Dorothy L.**, *Associate Professor, Parks, Recreation & Tourism Management*. BA, College of Wooster, 1993; MS, 1999, PhD, 2004, Pennsylvania State University
- Schmidt, Johannes**, *Associate Professor, Languages*. BA, University of Konstanz (Germany), 1992; MA, University of Massachusetts, 1995; PhD, University of Hamburg (Germany), 1999
- Schmoll, Martin J.**, *Associate Professor, Mathematical Sciences*. BS, 1987, BS, 1988, MS, 1993, University of Göttingen (Germany); PhD, Technical University of Berlin (Germany), 2000
- Schmucker, Ellory W.**, *Lecturer, Languages*. BA, 2008, MA, 2010, University of South Carolina
- Schmueser, David W.**, *Adjunct Professor, Automotive Engineering*. BS, 1973, MS, 1974, PhD, 1979, University of Michigan
- Schnabel, Guido**, *Professor, Agricultural & Environmental Sciences*. BA, 1990, MS, 1993, Justus Liebig University Giessen (Germany); PhD, University of Hohenheim (Germany), 1997

- Schoenfuss, Heiko L.**, *Adjunct Associate Professor, Biological Sciences*. BS, University of Bayreuth (Germany), 1991; MS, 1997, PhD, 1997, Louisiana State University
- Schoonover, Katharine A.**, *Lecturer, Communication Studies*. BA, Northern Illinois University, 2007; MA, Northern Illinois University, 2012
- Schrick, Frank N.**, *Adjunct Professor, Animal & Veterinary Sciences*. BS, Oklahoma State University, 1985; MS, 1988, PhD, 1990, Clemson University
- Schroeder, Jacob D.**, *Lecturer, Chemistry*. BS, South Dakota School of Mines and Technology, 2002; MS, 2005, PhD, 2008, Iowa State University
- Schurch, Thomas W.**, *Professor, Landscape Architecture; Professor, Planning, Development, and Preservation*. BA, US International University, 1971; MLA, California State Polytechnic University, 1978; PhD, University of Washington, 1989
- Schvaneveldt, Stephen J.**, *Senior Lecturer, Chemistry*. BA, Oregon State University, 1992; MS, 1995, PhD, 1996, Cornell University
- Schwartz, Charles E.**, *Adjunct Professor, Genetics & Biochemistry*. BA, Colgate University, 1970; MS, Oklahoma State University, 1972; PhD, Vanderbilt University, 1978
- Schwartz, Karen G.**, *Adjunct Instructor, Food, Nutrition, & Packaging Sciences*. BS, Western Carolina University, 1981; MS, Winthrop University, 1983
- Schweisinger, Todd A.**, *Senior Lecturer, Mechanical Engineering*. BS, University of California-Irvine, 1997; MS, 2001, PhD, 2007, Clemson University
- Schwensen, Katherine L.**, *Department Head and Professor, School of Architecture*. BA, 1978, MArch, 1980, Iowa State University
- Scott, David A.**, *Associate Professor, Education & Human Development*. BA, University of North Carolina-Wilmington, 1991; MS, Western Carolina University, 1994; PhD, North Carolina State University, 2004
- Scott, David T.**, *Assistant Professor, Communication Studies*. BFA, School of The Art Institute Chicago, 1991; MC, University of Washington, 2005; PhD, University of Southern California, 2010
- Scott, Joseph K.**, *Assistant Professor, Chemical & Biomolecular Engineering*. BS, Wayne State University, 2006; MS, 2008, PhD, 2012, Massachusetts Institute of Technology
- Scott, Kristin L. D.**, *Associate Professor, Management*. BS, Villanova University, 1994; MHR, University of South Carolina, 1996; PhD, University of Kentucky, 2007
- Scott, Mark C.**, *Adjunct Assistant Professor, Forestry & Environmental Conservation*. BS, Wofford College, 1987; MS, Virginia Tech, 1994; PhD, University of Georgia, 2001
- Scott, Simon W.**, *Professor, Biological Sciences*. BSc, Hatfield Polytechnic (England), 1971; PhD, University of Wales (Wales), 1974
- Scott, Thomas R.**, *Professor, Animal & Veterinary Sciences*. BS, 1976, MS, 1979, Louisiana State University; PhD, University of Georgia, 1983
- Scuras, Sean E.**, *Adjunct Assistant Professor, Environmental Engineering & Earth Sciences*. BS, Southern Illinois University-Carbondale, 1983; MS, University of Colorado-Denver, 1992; PhD, Clemson University, 2004
- Sears, Michael W.**, *Assistant Professor, Biological Sciences*. BS, Rhodes College, 1993; PhD, University of Pennsylvania, 2001
- Sehorn, Michael Glen**, *Associate Professor, Genetics & Biochemistry*. BS, New Mexico Institute of Mining and Technology, 1995; PhD, Louisiana State University Health Sciences Center-Shreveport, 2002
- Sekhon, Rajandeep S.**, *Assistant Professor, Genetics & Biochemistry*. BSc, 1992, MSc, 1994, Punjab Agricultural University (India); PhD, Pennsylvania State University, 2007
- Serkiz, Steven M.**, *Adjunct Associate Professor, Environmental Engineering & Earth Sciences*. BS, Furman University, 1985; PhD, Georgia Institute of Technology, 1991
- Seydim, Atif C.**, *Adjunct Professor, Animal & Veterinary Sciences*. BS, 1990, MS, 1994, Ankara University (Turkey); MS, 1996, PhD, 2001, Clemson University
- Seydim, Zepnep B.**, *Adjunct Professor, Animal & Veterinary Sciences*. BS, 1991, MS, 1994, Ankara University (Turkey); MS, 1996, PhD, 2001, Clemson University
- Seymour, Kerrie K.**, *Assistant Professor, Performing Arts*. BA, St. Bonaventure University, 1998; MFA, Brown University, 2001
- Shalaby, Waleed**, *Adjunct Assistant Professor, Bioengineering*. BS, 1988, PhD, 1992, Purdue University; MD, Medical University of South Carolina, 1996
- Shanley, Ellen**, *Adjunct Assistant Professor, Bioengineering*. BS, William Paterson University of New Jersey, 1982; MPT, Emory University, 1987; PhD, Rocky Mountain University of Health Professions, 2011
- Sharp, Benjamin E.**, *Visiting Lecturer, Mathematical Sciences*. BS, University of Evansville, 1999; MS, Montana State University-Bozeman, 2007; PhD, Clemson University, 2013
- Sharp, Julia L.**, *Associate Professor, Mathematical Sciences*. BS, University of Evansville, 1998; MS, 2001, PhD, 2007, Montana State University-Bozeman
- Sheffield, Kathryn M.**, *Assistant Librarian, University Libraries*. BS, 2006, MS, 2008, Clemson University; MLS, University of Maryland, 2009
- Shelnutt, Gregory W.**, *Department Head and Professor, Art*. BFA, East Carolina University, 1985; MFA, University of Georgia, 1988
- Shen, Hai Y.**, *Associate Professor, Electrical & Computer Engineering*. BS, Tongji University (China), 2000; MS, 2004, PhD, 2006, Wayne State University
- Sherrill, Windsor W.**, *Associate Vice President for Health Research; Professor, Public Health*. BS, Wake Forest University, 1987; MHA, MBA, University of Alabama-Birmingham, 1989; PhD, Brandeis University, 1999
- Shi, Changcheng**, *Adjunct Assistant Professor, Bioengineering*. BS, 2004, MS, 2007, Huazhong University of Science and Technology -Wuhan (China); PhD, Clemson University, 2012
- Shi, Lu**, *Assistant Professor, Public Health*. BA, Peking University (China), 1997; MPhil, 2005, PhD, 2008, Rand Graduate School of Policy Studies
- Shick, Laura J.**, *Lecturer, Mathematical Sciences*. BS, 1972, MS, 1981, University of Delaware
- Shirley, Anna B.**, *Lecturer, Animal & Veterinary Sciences*. BS, Berea College, 2003; MS, Clemson University, 2010
- Shoaf, Eric C.**, *Associate Librarian, University Libraries*. BA, Duke University, 1982; MLIS, North Carolina Central University, 1989; MPA, University of Rhode Island, 1999
- Shoji, Kazuko**, *Lecturer, Languages*. BA, 2007, MA, 2009, University of Franche-Comte (France)
- Shrivastav, Avadh B.**, *Adjunct Associate Professor, Biological Sciences*. MVS, 1981, PhD, 1991,
- Shuller-Nickles, Lindsay C.**, *Assistant Professor, Environmental Engineering & Earth Sciences*. BSE, 2005, MSE, 2007, PhD, 2010, University of Michigan
- Sianko, Natalia S.**, *Assistant Professor, Institute on Family & Neighborhood Life*. BS, Minsk State Linguistic University (Belarus), 2006; PhD, Clemson University, 2012
- Siemens, Jennifer D.**, *Assistant Professor, Marketing*. BA, 1998, MBA, 2000, PhD, 2003, University of Arkansas
- Silance, Robert T.**, *Associate Professor, School of Architecture*. BFA, Temple University, 1978; BA, 1973, MArch, 1981, Clemson University
- Silvestri, Michael S.**, *Associate Professor, History*. BA, Brown University, 1988; MA, 1991, MPhil, 1993, PhD, 1998, Columbia University
- Simionescu, Agneta**, *Assistant Professor, Bioengineering*. BS, 1981, PhD, 2001, University of Bucharest (Romania)
- Simionescu, Dan T.**, *Associate Professor, Bioengineering*. BS, 1981, PhD, 1999, University of Bucharest (Romania)
- Simmons, Alvin M.**, *Adjunct Professor, Agricultural & Environmental Sciences*. BS, East Carolina University, 1980; MS, 1983, PhD, 1987, University of Kentucky
- Simms, Donna M.**, *Senior Lecturer, Mathematical Sciences*. BS, Bob Jones University, 1990; MS, Clemson University, 1993
- Simon, Curtis J.**, *Professor, Economics*. BA, College of William and Mary, 1981; MA, 1983, PhD, 1985, State University of New York-Binghamton
- Simpson, Roger K.**, *Senior Lecturer, Languages*. BA, 1976, MEd, 1977, Clemson University
- Sims, Cynthia M.**, *Assistant Professor, Educational & Organizational Leadership Development*. BS, Lake Forest College, 1977; MEd, Harvard University, 1978; PhD, University of Maryland-Eastern Shore, 2014
- Sinclair, Robert R.**, *Professor, Psychology*. BA, University of Maine-Farmington, 1990; MA, 1992, PhD, 1995, Wayne State University
- Singapogu, Ravikiran B.**, *Research Assistant Professor, Institute on Biological Interfaces of Engineering*. BTech, Jawaharlal Nehru Technological University (India), 2004; MS, 2007, PhD, 2012, Clemson University
- Singh, Rajendra, D.**, *Houser Banks Professor, Electrical & Computer Engineering*. BS, Agra University (India), 1965; MS, Chauhary Charan Singh University (India), 1968; MS, Dalhousie University (Canada), 1974; PhD, McMaster University (Canada), 1979
- Sinwell, Nicole B.**, *Assistant Professor, Teaching & Learning*. BS, College of Charleston, 1999; MS, Clemson University, 2001; PhD, University of Washington, 2009
- Sitaraman, Murali**, *Professor, School of Computing*. BE, University of Madras (India), 1983; ME, Indian Institute of Science (India), 1984; PhD, Ohio State University, 1990
- Skewes, Peter A.**, *Professor, Animal & Veterinary Sciences*. BS, University of New Haven, 1979; MS, University of Florida, 1982; PhD, Virginia Tech, 1985
- Skinner, Steven A.**, *Adjunct Professor, Biological Sciences*. BS, Wofford College, 1975; MD, Medical University of South Carolina, 1979
- Skrodzka-Bates, Agnieszka**, *Associate Professor, English*. BA, 1996, MA, 1998, University of Warsaw (Poland); MA, 2004, PhD, 2007, State University of New York-Stony Brook
- Slack, William T.**, *Adjunct Assistant Professor, Agricultural & Environmental Sciences*. BS, 1988, MS, 1990, Northeast Louisiana University; PhD, University of Southern Mississippi, 1996
- Smail, Timothy R.**, *Adjunct Lecturer, Civil Engineering*. BS, Pennsylvania State University, 1990; MS, Georgia Institute of Technology, 1994
- Small, Mark A.**, *Professor, Institute on Family & Neighborhood Life*. BA, 1983, MA, 1985, University of Nevada-Las Vegas; JD, 1989, PhD, 1990, University of Nebraska
- Smiley, E. Thomas**, *Adjunct Professor, Agricultural & Environmental Sciences*. BS, University of Wisconsin, 1977; MS, Colorado State University, 1979; PhD, Michigan State University, 1985
- Smith, Christa A.**, *Associate Professor, History*. BA, 1987, MA, 1990, Marshall University; PhD, University of Tennessee, 2000
- Smith, Cynthia M.**, *Lecturer, Bioengineering*. BS, Clemson University, 1996; MS, Virginia Tech, 1998; PhD, University of Arizona, 2005
- Smith, Dane E.**, *Adjunct Faculty, Institute on Biological Interfaces of Engineering*. MD, Louisiana State University Health Sciences Center-Shreveport, 1984
- Smith, Daniel J.**, *Associate Professor, Languages*. BA, Bob Jones University, 1979; MEd, University of Georgia, 1985; PhD, University of Texas, 2002
- Smith, Deborah A.**, *Professor, Teaching & Learning*. BS, Madison College, 1977; MS, 1985, EdD, 1989, University of Tennessee
- Smith, Dennis W., Jr.**, *Adjunct Professor, Chemistry*. BS, 1988, PhD, 1992, University of Florida
- Smith, Douglas P.**, *Adjunct Associate Professor, Food, Nutrition, & Packaging Sciences*. BSA, 1984, MS, 1987, PhD, 1991, University of Georgia
- Smith, Eddie R.**, *Senior Lecturer, Communication Studies*. BA, 1979, MA, 1981, Bob Jones University
- Smith, Gordon L.**, *Adjunct Associate Professor, Food, Nutrition, & Packaging Sciences*. BS, University of Tennessee, 1984; MS, 1988, PhD, 1991, Texas A&M University
- Smith, James P.**, *Assistant Professor, Construction Science & Management*. BS, 2003, MS, 2010, Brigham Young University; PhD, Texas A&M University, 2013
- Smith, Jared D.**, *Assistant Professor, School of Accountancy & Finance*. BS, 2009, PhD, 2014, University of Pittsburgh
- Smith, John D.**, *Assistant Professor, Automotive Engineering*. BS, Clemson University, 2002; MSc, 2005, PhD, 2009, Queen's University (Canada)
- Smith, Jonathan C.**, *Department Head and Professor, Industrial Engineering*. BS, Clemson University, 1996; PhD, Virginia Tech, 2000
- Smith, Kelly C.**, *Associate Professor, Philosophy & Religion*. BA, Georgia State University, 1986; MS, 1991, PhD, 1994, Duke University
- Smith, Kelly J.**, *Lecturer, School of Nursing*. BS, 1992, MS, 2000, Clemson University
- Smith, Kerry S.**, *Professor, Genetics & Biochemistry*. BS, Georgia Institute of Technology, 1986; PhD, University of Pennsylvania, 1993

- Smith, Matthew C.**, *Academic Program Director, Pee Dee Research & Education Center; Professor, Agricultural & Environmental Sciences*. BS, University of Georgia, 1980; MS, North Carolina State University, 1983; PhD, University of Florida, 1988
- Smith, Melissa C.**, *Associate Professor, Electrical & Computer Engineering*. BS, 1993, MS, 1994, Florida State University; PhD, University of Tennessee, 2003
- Smith, Rhett C.**, *Associate Professor, Chemistry*. BS, University of Toledo, 2000; PhD, Case Western Reserve University, 2005
- Smotherman, Mark K.**, *Associate Professor, School of Computing*. BS, Middle Tennessee State University, 1977; PhD, University of North Carolina, 1984
- Snider, Eric H.**, *Adjunct Professor, Environmental Engineering & Earth Sciences*. BS, 1973, MS, 1975, PhD, 1978, Clemson University
- Snider, Jeromy B.**, *Academic Program Director, Office of Undergraduate Studies*. BA, Lee University, 1994; MS, 1999, PhD, 2002, Auburn University; MBA, East Tennessee State University, 2011
- Snyder, Erin M.**, *Lecturer, Food, Nutrition, & Packaging Sciences*. BS, 2012, MS, 2013, Clemson University
- Snyder, James A.**, *Research Assistant Professor, Bioengineering*. BS, 1987, BS, 1989, University of Nevada-Las Vegas; PhD, University of New Orleans, 1995
- Song, Bo**, *Associate Professor, Forestry & Environmental Conservation*. BS, Liaoning University (China), 1985; MS, Chinese Academy of Mechanical Sciences (China), 1988; PhD, Michigan Technological University, 1998
- Sorber, Jacob M.**, *Assistant Professor, School of Computing*. BS, Brigham Young University, 2002; MS, 2010, PhD, 2010, University of Massachusetts-Amherst
- Sosolik, Chad E.**, *Associate Professor, Physics & Astronomy*. BS, Texas A&M University, 1995; MS, 1998, PhD, 2001, Cornell University
- South, David B.**, *Adjunct Professor, Forestry & Environmental Conservation*. BS, 1982, MS, 1975, North Carolina State University; PhD, Auburn University, 1982
- Southworth, Stephanie**, *Senior Lecturer, Sociology*. BA, 2001, MA, 2004, PhD, 2008, University of North Carolina-Charlotte
- Sowder, Andrew G.**, *Adjunct Assistant Professor, Environmental Engineering & Earth Sciences*. BS, University of Rochester, 1990; PhD, Clemson University, 2006
- Spano, Meredith N.**, *Adjunct Associate Professor, Chemistry*. BS, Virginia Tech, 1996; PhD, Florida State University, 2002
- Sparace, Kathryn F.**, *Adjunct Assistant Professor, Biological Sciences*. BA, 1978, MS, 1981, University of Wyoming; PhD, University of California, 1990
- Sparace, Salvatore A.**, *Associate Professor, Biological Sciences*. BS, Cornell University, 1975; PhD, University of Wyoming, 1980
- Spearman, Melinda J.**, *Associate Professor, Teaching & Learning*. BA, Trinity University, 1997; MA, 1999, PhD, 2006, University of Texas
- Spede, Mark J.**, *Associate Professor, Performing Arts; Director of Bands*. BM, University of Michigan, 1984; MM, Ball State University, 1988; DMA, University of Texas, 1998
- Spencer, James H.**, *Department Chair, Planning Development, and Preservation*. BA, 1990, Amherst College; MEM, 1995, Yale University; PhD, 2002, University of California-Los Angeles.
- Sperry, Stephen L.**, *Senior Lecturer, Planning, Development, & Preservation*. BLA, State University of New York-Syracuse, 1970; MLA, Harvard University, 1975
- Speziale, Barbara J.**, *Associate Dean and Program Director, Summer Programs and Outreach, Office of Undergraduate Studies; Professor, Biological Sciences*. BA, State University of New York, 1974; MS, University of Minnesota, 1977; PhD, Clemson University, 1985
- Spinda, John S.**, *Assistant Professor, Communication Studies*. BS, 2000, MS, 2004, Clarion University of Pennsylvania; PhD, Kent State University, 2009
- Spitler, Hugh D.**, *Professor, Public Health*. BA, 1972, MA, 1974, University of South Florida; PhD, 1985, MPH, 1996, Emory University
- Springer, Thomas M.**, *Professor, School of Accountancy & Finance*. BS, University of Florida, 1978; MBA, 1986, PhD, 1988, University of Georgia
- Sridhar, Nigamanth**, *Adjunct Associate Professor, School of Computing*. MSc, Birla Institute of Technology (India), 1997; MS, 2000, PhD, 2004, Ohio State University-Columbus
- Sridharan, V.**, *Department Head and Professor, Management*. BE, Madurai-Kamaraj University (India), 1975; PhD, University of Iowa, 1987
- Srimani, Pradip K.**, *Professor, School of Computing*. BS, 1970, BTech, 1973, MTech, 1975, PhD, 1978, University of Calcutta (India)
- Srivastava, Anand K.**, *Adjunct Assistant Professor, Genetics & Biochemistry*. BS, 1979, MS, 1981, Allahabad University (India); PhD, Banaras Hindu University (India), 1986
- St. Peter, Richard E., Jr.**, *Assistant Professor, Performing Arts*. BA, Christopher Newport University, 1995; MFA, Virginia Commonwealth University, 1998; PhD, Texas Tech University, 2013
- Stancil, Sara L.**, *Lecturer, Food, Nutrition, & Packaging Sciences*. BS, 2008, MS, 2013, Clemson University
- Stansell, Elizabeth A.**, *Senior Lecturer, English*. BA, Presbyterian College, 2004; MA, Clemson University, 2006
- Starkey, Charles**, *Associate Professor, Philosophy & Religion*. BA, Claremont McKenna College, 1987; MA, 1995, PhD, 2001, University of Wisconsin
- Starr-Moss, Alison N.**, *Lecturer, Genetics & Biochemistry*. BS, Clemson University, 2003; PhD, Texas A&M University, 2007
- Steck, Mary B.**, *Assistant Professor, School of Nursing*. BSN, University of Iowa, 1977; MS, 1997, PhD, 2014, Clemson University
- Stecker, Pamela M.**, *Professor, Education & Human Development*. BS, 1982, MEd, 1988, Vanderbilt University; PhD, Vanderbilt University, 1993
- Stegall, David L.**, *Senior Lecturer, Philosophy & Religion*. BA, 1984, MLibSc, 1984, University of North Carolina; PhD, University of Georgia, 2001
- Stegelin, Dolores A.**, *Professor, Teaching & Learning*. BS, 1969, MS, 1970, Kansas State University; PhD, University of Florida, 1983
- Stephan, Elizabeth A.**, *Director, General Engineering; Senior Lecturer, Engineering and Science*. BS, 1993, PhD, 1999, University of Akron
- Stephens, Benjamin R.**, *Professor, Psychology*. BS, University of Georgia, 1979; PhD, University of Texas, 1985
- Stephens, Robert J.**, *Lecturer, Philosophy & Religion*. BA, Missouri State University, 1994; MA, University of Kansas, 1998; PhD, University of Iowa, 2004
- Sterling, Patrick D.**, *Lecturer, School of Computing*. BS, University of Louisiana at Lafayette, 1971; MHRD, Clemson University, 1997
- Sternhagen, Melissa M.**, *Senior Lecturer, Civil Engineering*. BS, University of Wisconsin-Platteville, 2000; MSE, Illinois Institute of Technology, 2005
- Stewart, Joseph E., Jr.**, *Professor, Political Science*. BA, University of Georgia, 1970; MA, Florida State University, 1971; PhD, University of Houston, 1977
- Stewart, Wayne H., Jr.**, *Associate Professor, Management*. BS/BA, 1984, MBA, 1988, Western Carolina University; PhD, University of North Texas, 1995
- Stith, Melvin T., Jr.**, *Visiting Assistant Professor, School of Accountancy & Finance*. BS, 1992, MBA, 1995, JD, 1998, Florida State University; PhD, University of Georgia, 2011
- Stockton, William H.**, *Associate Professor, English*. BA, University of Virginia, 2001; MA, 2004, PhD, 2007, Indiana University
- Stoddard, Allison K.**, *Senior Lecturer, Mathematical Sciences*. BA, 1985, MS, 1990, Clemson University
- Stoicesa, Gabriela**, *Assistant Professor, Languages*. BA, University of Craiova (Romania), 2001; MA, University of Bucharest (Romania), 2002; MA, University of Illinois, 2005; MPhil, 2008, MA, 2008, PhD, 2012, Yale University
- Straka, Thomas J.**, *Professor, Forestry & Environmental Conservation*. BS, 1972, MS, 1973, University of Wisconsin; MBA, University of South Carolina, 1978; PhD, Virginia Tech, 1981
- Strickland, James R.**, *Department Head and Professor, Animal & Veterinary Sciences*. BS, Missouri State University, 1987; MS, 1990, PhD, 1992, Clemson University
- Stuart, Steven J.**, *Professor, Chemistry*. BS, University of Delaware, 1990; MA, 1991, MPhil, 1994, PhD, 1995, Columbia University
- Stutey, Diane M.**, *Lecturer, Education & Human Development*. BA, Benedictine College, 1997; MA, University of Colorado-Colorado Springs, 2002; PhD, University of Northern Colorado, 2013
- Suedel, Burton C.**, *Adjunct Assistant Professor, Forestry & Environmental Conservation*. BS, 1985, MS, 1989, University of North Texas; PhD, University of Mississippi, 1993
- Summers, Joshua D.**, *Professor, Mechanical Engineering*. BSME, 1996, MSME, 1998, University of Missouri; PhD, Arizona State University, 2004
- Sun, Heshan**, *Assistant Professor, Management*. BA, Nankai University (China), 1999; MA, Peking University (China), 2002; PhD, Syracuse University, 2007
- Sun, Shuyu**, *Adjunct Associate Professor, Mathematical Sciences*. BEng, 1991, MEng, 1994, DEng, 1997, Tianjin University (China); MS, 2002, PhD, 2003, University of Texas
- Sun, Xiaoqian**, *Associate Professor, Mathematical Sciences*. BS, Nanjing Normal University (China), 1987; MS, 1993, DSci, 1999, East China Normal University (China); PhD, University of Missouri, 2006
- Sun, Ya-ping**, *Frank Henry Leslie Professor of Materials/Organic Chemistry*. BS, Zhengzhou Institute of Technology (China), 1982; MS, Zhejiang University (China), 1985; PhD, Florida State University, 1989
- Surver, William M.**, *Alumni Professor, Biological Sciences*. BS, St. Francis College, 1966; PhD, University of Notre Dame, 1974
- Suryan, Robert M.**, *Adjunct Associate Professor, Forestry & Environmental Conservation*. BS, Humboldt State University, 1989; MS, San Jose State University, 1995; PhD, Oregon State University, 2006
- Sutt, Edward G., Jr.**, *Adjunct Associate Professor, Civil Engineering*. BS, Worcester Polytechnic Institute, 1990; MS, 1996, PhD, 2000, Clemson University
- Swain, Scott D.**, *Assistant Professor, Marketing*. BS, Francis Marion University, 1991; BS, Clemson University, 1991; MBA, 1996, PhD, 2002, University of South Carolina
- Swaynham, Thomas**, *Adjunct Assistant Professor, Forestry & Environmental Conservation*. BS, 1984, MS, 1988, Clemson University
- Switzer, Deborah M.**, *Department Head and Professor, Education & Human Development*. BA, University of Texas, 1976; MEd, 1987, PhD, 1993, University of Illinois
- Switzer, Fred S., III**, *Professor, Psychology*. BA, University of Texas, 1975; MS, Lamar University, 1982; PhD, University of Illinois, 1988
- Swords, Allen N.**, *Senior Lecturer, English*. BA, 1997, MA, 2002, Clemson University
- Taaffe, Kevin M.**, *Associate Professor, Industrial Engineering*. BS, 1988, MS, 1990, University of Illinois; PhD, University of Florida, 2004
- Tafero, Tracey L.**, *Adjunct Assistant Professor, Psychology*. BA, Pennsylvania State University, 1999; MS, 2002, PhD, 2007, Clemson University
- Taiber, Joachim**, *Research Professor, Sustainable Mobility Institute*. BS, 1991, MS, 1991, PhD, 1996, Swiss Federal Institute of Technology (Switzerland)
- Takacs, Endre A.**, *Associate Professor, Physics & Astronomy*. Dipl, 1989, PhD, 1992, University of Debrecen (Hungary)
- Tallapragada, Phanindra**, *Assistant Professor, Mechanical Engineering*. BTech, 2004, MTech, 2004, Indian Institute of Technology (India); MS, 2010, PhD, 2020, Virginia Tech
- Tamura, Robert F.**, *Professor, Economics*. BS, College of William and Mary, 1981; MA, 1983, PhD, 1988, University of Chicago
- Tang, Tilan**, *Assistant Professor, School of Accountancy & Finance*. BA, 2001, BS, 2001, Shanghai Jiao Tong University (China); MA, Florida State University, 2004; PhD, Michigan State University, 2009
- Taweh, Jumah P.**, *Lecturer, Communication Studies*. BA, Pennsylvania State University, 2010; MA, Ball State University, 2014
- Taydas, Zeynep**, *Associate Professor, Political Science*. BA, Middle East Technical University (Turkey), 2000; MA, 2002, PhD, 2006, University of Missouri
- Taylor, Dennis F.**, *Senior Lecturer, Chemistry*. BS, King College, 1981; PhD, Virginia Tech, 1987
- Taylor, Dennis S.**, *Librarian, University Libraries*. BA, Piedmont College, 1977; MA, University of Georgia, 1981; MLS, Emory University, 1986
- Taylor, Mary A.**, *Professor, Psychology*. BA, Western Kentucky University, 1983; MS, Virginia Tech, 1985; PhD, University of Akron, 1990
- Taylor, Michael S.**, *Adjunct Assistant Professor, Bioengineering*. BS, Furman University, 2001; BS, 2002, PhD, 2008, Clemson University

- Taylor-Shockley, Megan N.**, *Professor, History*. BA, University of Richmond, 1993; MA, University of Tennessee, 1995; PhD, University of Arizona, 2000
- Teague, Gypsey**, *Associate Librarian, University Libraries*. BS, Plymouth State College, 1974; MBA, Oklahoma City University, 1986; MLArch, 1997, MCRP, 2000, MLIS, 2002, University of Oklahoma; MEd, Clemson University, 2010
- Teitloff, Timothy C.**, *Lecturer, Mathematical Sciences*. BA, 1989, MS, 1992, PhD, 1994, Clemson University
- Temesvari, Lesly**, *Alumni Professor, Biological Sciences*. BS, McGill University (Canada), 1987; PhD, University of Windsor (Canada), 1993
- Temples, Heide S.**, *Assistant Professor, School of Nursing*. BSN, Michigan State University, 1986; MSN, University of Texas-Arlington, 1993; PhD, Clemson University, 2014
- Temples, Tommy J.**, *Adjunct Associate Professor, Environmental Engineering & Earth Sciences*. BS, Clemson University, 1976; MS, University of Georgia, 1978; PhD, University of South Carolina, 1996
- Templeton, Scott R.**, *Associate Professor, Economics*. BA, 1983, MS, 1987, University of California-Santa Cruz; PhD, University of California, 1994
- Tennyson, Andrew G.**, *Assistant Professor, Chemistry*. BS, 2003, MS, 2003, University of Chicago; PhD, Massachusetts Institute of Technology, 2008
- Terry, William C.**, *Assistant Professor, History*. BA, Xavier University, 1999; MA, Miami University, 2004; PhD, University of South Carolina, 2009
- Tessendorf, Jerry A.**, *DPA Program Director and Professor, School of Computing*. BS, Washington University, 1980; MS, 1982, PhD, 1984, Brown University
- Testik, Ahmet**, *Adjunct Professor, Animal & Veterinary Sciences*. BSc, Ankara University (Turkey), 1969; PhD, Cukurova University (Turkey), 1974
- Testik, Firat Yener**, *Associate Professor, Civil Engineering*. BS, Middle East Technical University (Turkey), 1999; MS, University of Minnesota, 2000; PhD, Arizona State University, 2003
- Tewari, Sumanta**, *Associate Professor, Physics & Astronomy*. MSc, Indian Institute of Technology (India), 1997; PhD, University of California-Los Angeles, 2003
- Tharayil, Nishanth**, *Associate Professor, Agricultural & Environmental Sciences*. BS, Kerala Agricultural University Trichur (India), 1999; MSc, Govind Ballabh Pant University of Agriculture and Technology (India), 2002; PhD, University of Massachusetts-Amherst, 2007
- Thatcher, Jason B.**, *Professor, Management*. BA, 1994, BA, 1999, University of Utah; MPA, 1999, PhD, 2002, Florida State University
- Thavarajah, Dilrukshi**, *Assistant Professor, Agricultural & Environmental Sciences*. BSc, University of Peradeniya (Sri Lanka), 1996; MSc, 2002, PhD, 2006, University of Saskatchewan (Canada)
- The, Lih-sin**, *Lecturer, Physics & Astronomy*. BS, 1980, DrS, 1981, University of Indonesia (Indonesia); MS, 1985, PhD, 1989, University of Arizona
- Thibodeaux, Devron P.**, *Adjunct Professor, Mathematical Sciences*. BS, Loyola University, 1961; PhD, Louisiana State University, 1967
- Thies, Judy A.**, *Adjunct Professor, Agricultural & Environmental Sciences*. BS, 1972, MS, 1982, PhD, 1988, University of Minnesota
- Thies, Mark C.**, *Professor, Chemical & Biomolecular Engineering*. BChE, Georgia Institute of Technology, 1977; PhD, University of Delaware, 1985; PE
- Thigpen, Charles A.**, *Adjunct Assistant Professor, Bioengineering*. BS, 1997, MS, 2003, PhD, 2006, University of North Carolina
- Thomas, Lindsay C.**, *Assistant Professor, English*. BA, Colorado State University, 2006; MA, University of Colorado, 2008; PhD, University of California-Santa Barbara, 2014
- Thomas, Rhonda R.**, *Associate Professor, English*. BS, 1982, MS, 1988, University of Georgia; MA, University of New Hampshire, 2000; PhD, University of Maryland, 2007
- Thompson, C. Bradley**, *Professor, Clemson Institute for the Study of Capitalism*. BA, Western State College, 1982; MA, Boston College, 1984; PhD, Brown University, 1993
- Thompson, Lonny L.**, *Associate Professor, Mechanical Engineering*. BS, University of California, 1985; MS, 1989, PhD, 1994, Stanford University
- Thompson, Martha P.**, *Research Professor, Institute on Family & Neighborhood Life*. BA, 1989, MA, 1991, PhD, 1995, Georgia State University
- Thrasher, Joseph S.**, *Professor, Chemistry*. BS, 1978, PhD, 1981, Virginia Tech
- Thrift, Jason R.**, *Lecturer, School of Nursing*. BS, 2001, MS, 2011, Clemson University
- Thum, Kathleen A.**, *Assistant Professor, Art*. BFA, Maryland Institute College of Art, 1992; MFA, Bowling Green State University, 2000
- Thyroff, Anastasia E.**, *Assistant Professor, Marketing*. BS, Clemson University, 2008; MS, University of Georgia, 2009; PhD, University of Arkansas, 2013
- Timmons, Shirley M.**, *Associate Professor, School of Nursing*. BSN, 1978, MSN, 1988, PhD, 1999, University of South Carolina
- Tissera, Graciela E.**, *Associate Professor, Languages*. Licenciada en Gramatica Espanola, National University of Cordoba (Argentina), 1985; PhD, University of Pennsylvania, 1992
- Toews, Michael D.**, *Adjunct Assistant Professor, Agricultural & Environmental Sciences*. BS, Fort Hays State University, 1995; MS, 1998, PhD, 2001, Oklahoma State University
- Toline, Catherine A.**, *Adjunct Assistant Professor, Biological Sciences*. BS, 1983, MS, 1987, University of Illinois; PhD, University of Toronto (Canada), 1994
- Tollison, Robert D.**, *BB&T Senior Fellow and Professor, Economics*. BA, Wofford College, 1964; MA, University of Alabama, 1965; PhD, University of Virginia, 1969
- Tomberlin, Jeffery K.**, *Adjunct Associate Professor, Agricultural & Environmental Sciences*. BS, 1993, MS, 1996, PhD, 2001, University of Georgia
- Tong, Chenning**, *Professor, Mechanical Engineering*. BS, 1983, ME, 1986, Beijing Institute of Aeronautics and Astronautics (China); PhD, Cornell University, 1995
- Tonkin, Charles E., III**, *Research Associate Professor, Sonoco Institute of Packaging Design and Graphics; Adjunct Lecturer, Graphic Communications*. BS, 1992, MInEd, 1994, PhD, 2011, Clemson University
- Tonkyn, David W.**, *Associate Professor, Biological Sciences*. BA, 1976, MA, 1978, PhD, 1985, Princeton University
- Toole, Bryan P.**, *Adjunct Professor, Bioengineering*. BSc, University of Melbourne (Australia), 1962; MSc, 1965, PhD, 1968, Monash University (Australia)
- Toole, Ryan A.**, *Lecturer, Management*. BS, Clemson University, 2004; MBA, University of South Carolina, 2010
- Topping, Chris M.**, *Adjunct Assistant Professor, Chemistry*. PhD, Hull University (England), 1998
- Touya, Eric R.**, *Associate Professor, Languages*. BA, University of California, 1992; MA, 1994, PhD, 2002, University of Chicago; DEA, University of Paris-Sorbonne (France), 1997
- Townsend, Jasmine N.**, *Assistant Professor, Parks, Recreation & Tourism Management*. BA, Utah State University, 2005; MS, Brigham Young University, 2008; PhD, Indiana University, 2012
- Tredway, Lane P.**, *Adjunct Associate Professor, Agricultural & Environmental Sciences*. BS, Pennsylvania State University, 1996; MS, Rutgers University, 1999; PhD, University of Georgia, 2002
- Tremolada, Ricardo R.**, *Lecturer, Languages*. BA, 1990, MA, 1992, State University of New York-Albany
- Tritt, Terry M.**, *Alumni Professor, Physics & Astronomy*. BA, 1980, PhD, 1985, Clemson University
- Truong, Khoa Dang**, *Associate Professor, Public Health*. BA, Hue University (Vietnam), 1993; MA, Williams College, 2000; MPhil, 2004, PhD, 2007, Rand Graduate School of Policy Studies
- Tsai, Kate W.**, *Lecturer, Genetics & Biochemistry*. BS, 2001, PhD, 2005, Texas A&M University
- Tsui, Kevin Ka Kin**, *Associate Professor, Economics*. BS, 1995, MPhil, 1997, University of Hong Kong (China); PhD, University of Chicago, 2006
- Tucker, Teresa W.**, *Lecturer, Parks, Recreation & Tourism Management*. BS, Presbyterian College, 1989; MS, State University of New York-Cortland, 2003; PhD, Clemson University, 2010
- Tumblin, William E., II**, *Lecturer, CBBS Undergraduate Advising Center*. BS, 1988, MS, 1989, Clemson University
- Turcan, Marian V.**, *Research Assistant Professor, Institute on Family & Neighborhood Life*. BA, International University of Moldova (Moldova), 2000; MHRD, 2004, EdD, 2010, Clemson University
- Turick, Charles E.**, *Adjunct Professor, Biological Sciences*. BS, University of Pennsylvania, 1976; MS University of West Virginia, 1986; PhD, University of New Hampshire, 2001
- Turnbull, Matthew W.**, *Associate Professor, Biological Sciences*. BS, 1994, MA, 1999, College of William and Mary; PhD, University of Kentucky, 2002
- Turner, Brandon P.**, *Assistant Professor, Political Science*. BA, Miami University, 2003; MA, 2005, PhD, 2008, University of Wisconsin
- Tyler, Peggy J.**, *Librarian, University Libraries*. BS, Johnson State College, 1983; MLS, State University of New York-Albany, 1988; PhD, Clemson University, 2012
- Tyminski, Andrew M.**, *Associate Professor, Teaching & Learning*. BS, State University of New York-Buffalo, 1992; MEd, 2003, PhD, 2006, University of Georgia
- Tyrrell, Richard A.**, *Professor, Psychology*. BA, Hartwick College, 1985; MS, 1989, PhD, 1993, Pennsylvania State University
- Tzeng, Tzuen-Rong Jeremy**, *Associate Professor, Biological Sciences*. BS, Tsinghai University (China), 1985; PhD, Clemson University, 1998
- Urban, Marek W.**, *Endowed Chair, School of Materials Science & Engineering*. BS/MS, University of Mining and Metallurgy (Poland), 1979; MS, Marquette University, 1981; PhD, Michigan Technological University, 1984
- Vahidi, Ardalan**, *Associate Professor, Mechanical Engineering*. BS, 1996, MS, 1998, Sharif University of Technology (Iran); MS, George Washington University, 2001; PhD, University of Michigan, 2005
- Valentini, Antony**, *Professor, Physics & Astronomy*. BA, University of Cambridge (England), 1986; PhD, International School for Advanced Studies (Italy), 1992
- Van Bloem, Skip J.**, *Academic Program Director, Belle W. Baruch Forest Science Institute*. BA, Western Michigan University, 1991; MS, Ohio State University, 1996; PhD, Michigan State University, 2004
- Van den Hurk, Peter**, *Associate Professor, Biological Sciences*. BS, University of Groningen (Netherlands), 1983; MS, University of Amsterdam (Netherlands), 1988; PhD, College of William and Mary, 1998
- Van Dyken, Jennifer E.**, *Lecturer, Mathematical Sciences*. BA, Southwestern University, 2005; MS, Clemson University, 2008
- Van Horn, Mark H.**, *Adjunct Faculty, Bioengineering*. BS, Tri-State University, 1986; MS, 1988, PhD, 1996, North Carolina State University
- Vander Mey, Brenda J.**, *Professor, Sociology*. BA, Trinity Christian College, 1978; MA, 1981, PhD, 1984, Mississippi State University
- Vander Mey, Gerald A.**, *Adjunct Professor, Planning, Development, & Preservation*. BLA, 1982, MS, 1984, Mississippi State University; RLA
- Vander Zanden, Robert J.**, *Adjunct Assistant Professor, Food, Nutrition, & Packaging Sciences*. BS, University of Wisconsin-Platteville, 1968; MS, 1971, PhD, 1974, Kansas State University
- Vargas, Penelope D.**, *Assistant Professor, Education & Human Development*. BA, University of London (England), 2004; MEd, 2010, PhD, 2012, University of Oklahoma
- Vassalos, Michael**, *Assistant Professor, Agricultural & Environmental Sciences*. MSc, Agricultural University of Athens (Greece), 2005; MSc, 2008, PhD, 2013, University of Kentucky
- Vaughn, Christopher D.**, *Adjunct Instructor, Forestry & Environmental Conservation*. BS, Lander University, 1992; MS, Clemson University, 1996
- Venayagamoorthy, Ganesh K.**, *Duke Energy Distinguished Professor, Electrical & Computer Engineering*. BEng, Abubakar Tafawa Balewa University (Nigeria), 1994; MScEng, 1999, PhD, 2002, University of Natal (South Africa)
- Venhovens, Paul**, *BMW Chair in Systems Integration and Professor, Automotive Engineering*. Athenium, Norbertus College (Netherlands), 1985; MSc, 1989, PhD, 1993, Delft University of Technology (Netherlands)
- Verma, Rohit**, *Adjunct Professor, Management*. BTech, Indian Institute of Technology (India), 1989; MS, 1991, PhD, 1995, University of Utah
- Vernon, Kristine L.**, *Associate Professor, Animal & Veterinary Sciences*. BS, North Carolina State University, 1998; MS, Michigan State University, 2000; PhD, Clemson University, 2008
- Vertegel, Alexey A.**, *Associate Professor, Bioengineering*. BS, 1993, PhD, 1996, Moscow State University (Russia)

- Viktorova, Irina V.**, *Senior Lecturer, Mathematical Sciences*. MS, Moscow State University (Russia), 1977; PhD, Institute of Machines Science of the Russian Academy of Sciences (Russia), 1983
- Vincent, Julian F., V.**, *Adjunct Professor, School of Materials Science & Engineering*. BA, 1962, MA, 1971, University of Cambridge (England); PhD, 1965, DSc, 1982, University of Sheffield (England)
- Vinson, Christopher G.**, *Assistant Librarian, University Libraries*. BA, Winthrop University, 2006; MLIS, University of South Carolina, 2008
- Visconti, Richard P.**, *Adjunct Assistant Professor, Bioengineering*. BS, Ursinus College, 1988; MS, 1992, PhD, 1995, Temple University
- Visser, Ryan D.**, *Lecturer, Education & Human Development*. BS, College of William and Mary, 1995; MEd, 2000, PhD, 2009, Clemson University
- Vitanza, Victor J.**, *Professor, English*. BA, 1967, MA, 1970, University of Houston; PhD, Northern Illinois University, 1975; PhD, European Graduate School (Switzerland), 2004
- Vogel, Melissa A.**, *Associate Professor, Anthropology*. BA, University of California-Los Angeles, 1995; MA, 2000, PhD, 2003, University of Pennsylvania
- Voss, Frank R.**, *Adjunct Associate Professor, Bioengineering*. BS, Brown University, 1982; MD, Harvard University, 1986
- Vyavahare, Narendra R.**, *Hunter Endowed Chair and Professor, Bioengineering*. BS, 1983, MS, 1985, PhD, 1990, University of Pune (India)
- Wagener, Earl H.**, *Adjunct Assistant Professor, Chemistry*. BS, 1962, PhD, 1967, Clemson University
- Waggoner, Joshua N.**, *Lecturer, English*. MA, New York University, 2004; BA, 2000, PhD, 2013, University of California-Davis
- Wagner, John R.**, *Professor, Mechanical Engineering*. BS, 1983, MS, 1985, State University of New York-Buffalo; PhD, Purdue University, 1989
- Wagner, Leslie Anne**, *Lecturer, School of Nursing*. BS, University of Iowa, 2008; MS, Clemson University, 2011
- Wagner, Thomas E.**, *Adjunct Professor, Chemistry*. BA, Princeton University, 1964; PhD, Northwestern University, 1966
- Waldrop, Thomas A.**, *Adjunct Professor, Forestry & Environmental Conservation*. BS, 1978, MS, 1980, Clemson University; PhD, University of Tennessee, 1983
- Walker, Erica B.**, *Lecturer, Graphic Communications*. BFA, University of Colorado, 2000; MS, Clemson University, 2005
- Walker, Ian D.**, *Professor, Electrical & Computer Engineering*. BS, University of Hull (England), 1983; MS, 1985, PhD, 1989, University of Texas
- Walker, Joan L.**, *Adjunct Professor, Forestry & Environmental Conservation; Adjunct Assistant Professor, Biological Sciences*. BS, Lebanon Valley College, 1975; MS, 1980, PhD, 1985, University of North Carolina
- Walker, S. Erwin**, *Senior Lecturer, Mathematical Sciences*. BA, University of North Carolina, 1996; MS, 1998, PhD, 2006, Clemson University
- Walker, Terry H.**, *Professor, Environmental Engineering & Earth Sciences*. BS, 1989, MS, 1992, PhD, 1997, University of Tennessee
- Wall, Kay L.**, *Academic Program Director, Watt Family Innovation Center*. BA, University of Mississippi, 1978; MLS, Louisiana State University, 1981
- Waller, Neil G.**, *Professor, School of Accountancy & Finance*. BS, 1975, MA, 1978, University of Florida; PhD, University of Texas, 1986; MAI
- Walsh, Catherine J.**, *Adjunct Associate Professor, Animal & Veterinary Sciences*. BS, Hope College, 1985; MS, 1987, PhD, 1991, Clemson University
- Walters, David Matt**, *Adjunct Professor, Biological Sciences*. BA, 1991, MS, 1997, PhD, 2002, University of Georgia
- Wang, Gaofeng G.**, *Professor, Forestry & Environmental Conservation*. BSc, 1983, MSc, 1986, Nanjing Forestry University (China); PhD, University of British Columbia (Canada), 1993
- Wang, Kuang-Ching**, *Associate Professor, Electrical & Computer Engineering*. BS, 1997, MS, 1999, National Taiwan University (Taiwan); MS, 2001, PhD, 2003, University of Wisconsin
- Wang, Liang Jiang**, *Associate Professor, Genetics & Biochemistry*. BS, Zhejiang University (China), 1986; MS, Mississippi State University, 2001; PhD, University of Georgia, 1999
- Wang, Pingshan**, *Associate Professor, Electrical & Computer Engineering*. BS, University of Electronic Science and Technology of China (China), 1985; PhD, Tsinghua University (China), 2000; PhD, Cornell University, 2004
- Wang, Qiang**, *Adjunct Assistant Professor, Forestry & Environmental Conservation*. BS, East China University of Science and Technology (China), 1991; MS, Institute of Biochemistry, Chinese Academy of Sciences (China), 1997; PhD, Zhejiang University (China), 2003
- Wang, Shouqiang**, *Assistant Professor, Management*. BA, 2006, BS, 2006, Peking University (China); MS, 2011, PhD, 2011, Duke University
- Wang, Yongqiang**, *Assistant Professor, Electrical & Computer Engineering*. BE, Xi'an Jiaotong University (China), 2004; PhD, Tsinghua University (China), 2009
- Wang, Yue**, *Assistant Professor, Mechanical Engineering*. BS, Shanghai University (China), 2005; MS, 2008, PhD, 2011, Worcester Polytechnic Institute
- Wang, Zijun**, *Professor, School of Computing*. BS, 1990, MS, 1993, University of Science and Technology (China); PhD, University of Central Florida, 2001
- Warber, Adam L.**, *Associate Professor, Political Science*. BA, Hope College, 1993; MA, Western Michigan University, 1996; PhD, Texas A&M University, 2002
- Ward, James L.**, *Adjunct Lecturer, Planning, Development, & Preservation*. BA, 1974, BLA, 1979, MLA, 1992, University of Georgia
- Ward, Marvin M.**, *Lecturer, Management*. BA, Cleveland State University, 1975; MA, Case Western Reserve University, 1976
- Ward-Vaughn, Virginia L.S.**, *Senior Lecturer, School of Accountancy & Finance*. BA, University of Hawaii, 1982; JD, George Washington University, 1987; MPAcc, Clemson University, 1995
- Waring, George O., IV**, *Adjunct Assistant Professor, Bioengineering*. BA, 1993, BA, 1994, MD, 2003, Emory University
- Warner, Daniel D.**, *Professor, Mathematical Sciences*. BS, 1965, MA, 1966, Arizona State University; PhD, University of California-San Diego, 1974
- Warner, John R., III**, *Adjunct Assistant Professor, Bioengineering*. BS, Clemson University, 1981; MAcc, University of Georgia, 1982
- Warren, Patrick L.**, *Associate Professor, Economics*. BA, University of South Carolina, 2001; PhD, Massachusetts Institute of Technology, 2008
- Watkins, Richard J., Jr.**, *Department Head and Associate Professor, General Engineering*. BS, Auburn University, 1983; BS, 1990, MS, 1991, PhD, 2004, U.S. Naval Postgraduate School
- Watson, Charity N.**, *Lecturer, Mathematical Sciences*. BS, Furman University, 2007; MS, 2009, PhD, 2012, Clemson University
- Watt, Paula J.**, *Manager, Clinical Education & Practice, Joseph F. Sullivan Center; Lecturer, School of Nursing*. BS, 1993, MS, 1994, Clemson University; PhD, Clayton College of Natural Health, 1999
- Weathers, Melinda R.**, *Assistant Professor, Communication Studies*. BA, Texas A&M University, 2003; MA, University of Houston, 2008; PhD, George Mason University, 2012
- Weathers, Peter D., III**, *Associate Professor, Marketing*. BS, Clemson University, 1994; MS, 1996, PhD, 2002, University of South Carolina
- Webb, Charles K.**, *Associate Professor, Bioengineering*. BS, Clemson University, 1992; PhD, University of Utah, 1999
- Webster, Sheri S.**, *Instructor, School of Nursing*. BS, Clemson University, 1980; MS, Mercer University, 2006
- Wechter, William P.**, *Adjunct Professor, Agricultural & Environmental Sciences*. BS, Winthrop University, 1983; MS, 1994, PhD, 2000, Clemson University
- Wei, Yanzhang**, *Professor, Biological Sciences*. BS, Shenyang Normal University (China), 1982; MS, Institute of Hydrobiology of the Chinese Academy of Sciences (China), 1985; PhD, Ohio University, 1996
- Weinbrenner, Donna R.**, *Senior Lecturer, Biological Sciences*. BS, 1994, MS, 1998, PhD, 2010, Clemson University
- Weise, Jillian M.**, *Associate Professor, English*. BS, Florida State University, 2002; MFA, University of North Carolina-Greensboro, 2004; PhD, University of Cincinnati, 2010
- Weisenmiller, Eric M.**, *Associate Professor, Graphic Communications*. BA, 1993, MT, 1995, Georgia Southern University; PhD, Virginia Tech, 1999
- Weisense, Katherine E.**, *Associate Professor, Anthropology*. BA, Brandeis University, 1999; MA, 2001, PhD, 2007, University of Tennessee
- Weiss, Charles Tabor**, *Assistant Professor, Graphic Communications*. BA, American University, 1991; BS, 1996, MA, 1998, Appalachian State University; EdD, Virginia Tech, 2009
- Welch, David O.**, *Adjunct Professor, Physics & Astronomy*. BS, University of Tennessee, 1960; SM, Massachusetts Institute of Technology, 1962; PhD, University of Pennsylvania, 1964
- Wells, Christina E.**, *Associate Professor, Biological Sciences*. BS, Temple University, 1994; PhD, Pennsylvania State University, 1999
- Welsh, Ralph S.**, *Lecturer, Public Health*. BS, University of Wisconsin-Milwaukee, 1991; MS, University of South Carolina, 1998
- Welton, Ralph E., Jr.**, *Professor and Undergraduate Coordinator, School of Accountancy & Finance*. BA, Anderson University, 1976; MS, 1978, PhD, 1982, Louisiana State University
- Wentworth, William M.**, *Professor, Sociology*. BA, Indiana University, 1972; MA, University of Maryland, 1974; PhD, University of Virginia, 1978
- Wersal, Ryan M.**, *Adjunct Assistant Professor, Forestry & Environmental Conservation*. BS, 2002, BS, 2002, MS, 2004, Minnesota State University-Mankato; PhD, Mississippi State University, 2010
- Wesley, Kathryn M.**, *Associate Librarian, University Libraries*. BA, University of Louisiana at Monroe, 1977; MLIS, University of Southern Mississippi, 1997
- Wesolek, Andrew J.**, *Assistant Librarian, University Libraries*. BA, Washington College, 2006; MS, Rutgers University, 2010
- Wetsel, Margaret A.**, *Associate Professor, School of Nursing*. BSN, Indiana University, 1978; MS, Ohio State University, 1979; PhD, University of Texas, 1988
- Wetzler, Modi**, *Lecturer, Chemistry*. BA, 1999, BA, 1999, State University of New York-Buffalo; PhD, University of California, 2007
- Wheeler, Alfred G., Jr.**, *Adjunct Professor, Agricultural & Environmental Sciences*. BA, Grinnell College, 1966; PhD, Cornell University, 1971
- Whisler, Bruce Allen**, *Associate Professor, Performing Arts; Director, Audio Technology*. BS, 1982, MM, 1992, DMA, 2002, Ball State University
- Whisler, Laurel Ann C.**, *Lecturer, Academic Success Center*. BA, Earlham College, 1989; MA, Pennsylvania State University, 1992; MLS, Indiana University, 1996
- Whitcomb, John J.**, *Assistant Professor, School of Nursing*. BS, Medical University of South Carolina, 1991; MSN, Marymount University, 1999; PhD, University of San Diego, 2005
- White, Benjamin L.**, *Assistant Professor, Philosophy & Religion*. BBA, Campbell University, 1999; MA, Gordon-Conwell Theological Seminary, 2002; Th.M., Duke University, 2004; PhD, University of North Carolina, 2011
- White, David Lawrence**, *Research Assistant Professor, Cyberinfrastructure Technology Integration; Adjunct Associate Professor, Environmental Engineering & Earth Sciences*. BS, University of Oregon, 1991; MS, University of Charleston, 1997; PhD, University of South Carolina, 2003
- White, Sarah A.**, *Associate Professor, Agricultural & Environmental Sciences*. MS, Virginia Tech, 2003; BS, 2000, PhD, 2007, Clemson University
- White, William C.**, *Lecturer, Sociology*. BS, University of North Alabama, 1994; JD, Quinnipiac University, 2001
- Whitehead, Andrew L.**, *Assistant Professor, Sociology and Anthropology*. BA, Purdue University, 2005; MA, 2009, PhD, 2012, Baylor University
- Whitehead, Daniel C.**, *Assistant Professor, Chemistry*. BS, 2002, MS, 2003, Furman University; PhD, Michigan State University, 2009
- Whitehead, Kristi J.**, *Lecturer, Biological Sciences*. BS, Furman University, 2003; PhD, Michigan State University, 2003
- Whitehouse, Allison A.**, *Lecturer, Languages*. BA, 2007, MA, 2010, University of South Carolina
- Whiteside, William S.**, *Associate Professor, Food, Nutrition, & Packaging Sciences*. BS, 1984, MS, 1986, PhD, 1999, Clemson University
- Whitlock, Laura**, *Assistant Professor, Psychology*. BS, 2008, MS 2011, North Carolina State University
- Whitwell, Ted**, *Associate Dean for Academic Programs, College of Agriculture, Forestry, & Life Sciences; Professor, Agricultural & Environmental Sciences*. BS, University of Tennessee-Martin, 1972; MS, 1974, PhD, 1977, Oklahoma State University

- Wicker, David L.**, *Adjunct Professor, Animal & Veterinary Sciences*. BS, 1969, PhD, 1973, Clemson University
- Widener, Sally K.**, *Associate Professor, School of Accountancy & Finance*. BBA, University of Houston, 1984; MAcc, Colorado State University, 1995; PhD, University of Colorado, 1999
- Widgren, Kenneth D.**, *Lecturer, Languages*. BA, Georgia State University, 1998; MA, 2005, PhD, 2014, University of Georgia
- Wiecek, Margaret M.**, *Professor, Mathematical Sciences*. MS, 1979, PhD, 1984, University of Mining and Metallurgy (Poland)
- Wiggers, Ernie P.**, *Adjunct Professor, Forestry & Environmental Conservation*. BS, 1975, MS, 1979, Clemson University; PhD, Texas Tech University, 1983
- Wiggins, Stacey D.**, *Assistant Professor, Aerospace Studies; Major, U.S. Air Force*. BS, Peru State College, 2001; MS, University of Alabama, 2007
- Wigley, T Bently, Jr.**, *Adjunct Professor, Forestry & Environmental Conservation*. BS, 1975, MS, 1977, PhD, 1981, Mississippi State University
- Wilder, Phillip M.**, *Assistant Professor, Education & Human Development*. BA, 1995, MEd, 2001, PhD, 2013, University of Illinois
- Willey, Jeffrey S.**, *Adjunct Assistant Professor, Bioengineering*. BS, 1999, MS, 2001, Ohio University; PhD, Clemson University, 2008
- Williams, Calvin L.**, *Associate Professor, Mathematical Sciences*. BS, College of Charleston, 1981; PhD, Medical University of South Carolina, 1987
- Williams, Joel Edward**, *Associate Professor, Public Health*. BS, Lander University, 1996; MPH, 2001, PhD, 2004, University of South Carolina
- Williams, Sean D.**, *Professor, English*. BA, University of Utah, 1992; MA, University of Arizona, 1996; PhD, University of Washington, 1999
- Williams, Timothy H.**, *Adjunct Associate Professor, Bioengineering*. BS, Erskine College, 1989; MD, Medical University of South Carolina, 1992
- Willis, David Brian**, *Associate Professor, Agricultural & Environmental Sciences*. BS, Rocky Mountain College, 1976; MA, 1987, PhD, 1993, Washington State University
- Willoughby, Deborah F.**, *Professor, School of Nursing*. BS, 1976, MS, 1986, Clemson University; PhD, Georgia State University, 1995
- Wills, William**, *Adjunct Assistant Professor, Agricultural & Environmental Sciences*. BS, Fresno State College, 1959; MS, Pennsylvania State University, 1965
- Wilmoth, Tiffany A.**, *Assistant Professor, Animal & Veterinary Sciences*. BS, 2007, MS, 2009, PhD, 2012, West Virginia University
- Wilmott, Robert D.**, *Associate Librarian, University Libraries*. BCJ, 1992, BA, 1992, New Mexico State University; MLIS, University of South Carolina, 2002
- Wilson, Christopher A.**, *Lecturer, Chemistry*. BA, 2002, PhD, 2007, University of Colorado
- Wilson, Lee Brady**, *Assistant Professor, History*. BA, Loyola College-Maryland, 2001; JD, Fordham University, 2006; MA, Fordham University, 2006
- Wilson, Paul Wayne**, *Professor, Economics; Adjunct Professor, School of Computing*. BA, Rice University, 1980; AM, 1982, PhD, 1986, Brown University
- Wilson, Seal N.**, *Lecturer, Teaching & Learning*. BS, Winthrop University, 1988; MA, Furman University, 1991; PhD, University of Southern Mississippi, 1994
- Winslow, Sarah E.**, *Associate Professor, Sociology*. BA, 2000, BA, 2000, Skidmore College; MA, 2002, PhD, 2006, University of Pennsylvania
- Wintz, Joseph A.**, *Senior Lecturer, Construction Science & Management*. BS, University of Virginia, 1970; MS, George Washington University, 1974; JD, George Mason University, 1998
- Witter, David E.**, *Adjunct Professor, School of Materials Science & Engineering*. BS, 1966, MS, 1968, North Carolina State University
- Wolf, Jack G.**, *Associate Professor, School of Accountancy & Finance*. BA, University of Virginia, 1991; MBA, Wake Forest University, 1993; PhD, University of Utah, 2000
- Wolff, Bradley C.**, *Adjunct Professor, Graphic Communications*. BS, Rochester Institute of Technology, 1974; MBA, University of Connecticut, 1979
- Wong, Po-Keung**, *Adjunct Professor, Forestry & Environmental Conservation*. B.Sc., 1977, M.Phil., 1979, Chinese University of Hong Kong (China); PhD, University of California-Davis, 1993
- Wood, Daniel H.**, *Assistant Professor, Economics*. BA, Swarthmore College, 2000; PhD, Harvard University, 2008
- Woodard, James D.**, *Strom Thurmond Chair of Government and Professor, Political Science*. BS, Abilene Christian University, 1970; MA, American University, 1973; PhD, Vanderbilt University, 1978
- Woodward-Detrich, Denise C.**, *Director, Rudolph E. Lee Gallery; Senior Lecturer, Art*. BFA, Wichita State University, 1990; MFA, Alfred University, 1992
- Woolbright, Nona L.**, *Associate Professor, Graphic Communications*. BA, California State University-Chico, 1983; MS, Central Missouri State University, 1986; EdD, Clemson University, 1995
- Woolsey-Goodman, Megan E.**, *Lecturer, English*. BA, 2002, MA, 2005, Southern Illinois University; PhD, University of Missouri-Columbia, 2013
- Wrangle, Anderson**, *Associate Professor, Art*. BA, University of the South, 1992; MFA, University of Houston, 2001
- Wright, Brett A.**, *Interim Dean, College of Health, Education, & Human Development; Professor, Parks, Tourism & Recreation Management*. BA, 1975, MA, 1976, Morehead State University; PhD, Texas A&M University, 1985
- Wright, Christopher C.**, *Adjunct Associate Professor, Bioengineering*. BA, 1982, MD, 1987, Rutgers University
- Wright, Julia S.**, *Lecturer, Educational & Organizational Leadership Development*. BA, 1975, MA, 1976, Morehead State University
- Wu, Yi**, *Assistant Professor, Anthropology*. BA, Renmin University (China), 1989; MA, State University of New York-Binghamton, 1996; MPhil, 2001, PhD, 2010, Columbia University
- Wueste, Daniel E.**, *Director, Rutland Institute for Ethics; Professor, Philosophy and Religion*. BA, 1976, MA, 1979, University of Wisconsin; PhD, Washington University, 1985
- Wyatt, Douglas E.**, *Adjunct Assistant Professor, Environmental Engineering & Earth Sciences*. BA, University of Tennessee, 1980; MS, Vanderbilt University, 1985; PhD, University of South Carolina, 1995
- Wyffels, Jennifer T.**, *Adjunct Assistant Professor, Animal & Veterinary Sciences*. BS, Bradley University, 1991; PhD, Clemson University, 2001
- Xiao, Hai**, *Named Professor, Electrical & Computer Engineering*. BS, 1991, BS, 1991, MS, 1993, Tianjin University (China); PhD, Virginia Tech, 2000
- Xie, Fei**, *Named Professor, School of Accountancy & Finance*. BS, Tsinghua University (China), 1998; PhD, Vanderbilt University, 2005
- Xuan, Xiangchun**, *Associate Professor, Mechanical Engineering*. BEng, University of Science and Technology (China), 1995; DEng, Chinese Academy of Sciences (China), 2000; PhD, University of Toronto (Canada), 2006
- Xue, Hui**, *Associate Professor, Mathematical Sciences*. MA, East China Normal University (China), 1995; MA, 1998, PhD, 2002, Columbia University
- Yao, Hai**, *Associate Professor, Bioengineering*. BS, 1991, PhD, 1996, Xi'an Jiaotong University (China); PhD, University of Miami, 2004
- Yarrow, Greg K.**, *Department Head and Professor, Forestry & Environmental Conservation*. BS, University of Southern Mississippi, 1977; MS, Mississippi State University, 1979; DF, Stephen F. Austin State University, 1987
- Yasmin, Nighat**, *Senior Lecturer, General Engineering*. BSc, University of Peshawar (Pakistan), 1981; BSc, NWFU University of Engineering and Technology (Pakistan), 1986; MSc, University of Alberta (Canada), 1993; MS, University of Mississippi, 1999
- Ye, Tong**, *Assistant Professor, Bioengineering*. BS, Fudan University (China), 1989; PhD, Chinese Academy of Sciences (China), 1995
- Yelverton, Fred H.**, *Adjunct Professor, Agricultural & Environmental Sciences*. BS, 1981, MS, 1984, PhD, 1990, North Carolina State University
- Yoder, Christi A.**, *Adjunct Assistant Professor, Forestry & Environmental Conservation*. BS, 1991, MS, 2000, PhD, 2006, Colorado State University
- Yoder, Sara E.**, *Senior Lecturer, Management*. BS, Furman University, 1995; MS, 1997, PhD, 2009, Clemson University
- Yoon, Jeong-Rock**, *Associate Professor, Mathematical Sciences*. BS, Seoul National University (Korea), 1993; MS, 1995, PhD, 2001, Korea Advanced Institute of Science and Technology (Korea)
- Yost, Michael J.**, *Adjunct Associate Professor, Bioengineering*. BS, Ohio State University, 1985; MS, Ohio University, 1990; PhD, University of South Carolina, 1999
- Young, Kurt A.**, *Adjunct Assistant Professor, Food, Nutrition, & Packaging Sciences*. BA, Barrington College, 1981; MS, 1985, PhD, 1992, University of Rhode Island
- Yu, Xianzhong**, *Associate Professor, Biological Sciences*. BS, Linyang Agricultural College (China), 1985; MS, Changchun University (China), 1988; PhD, Ohio University, 1998
- Yun, Xueyan**, *Adjunct Assistant Professor, Bioengineering*. BS, 1985, MS, 1988, Tianjin University (China); PhD, University of Miami, 2000
- Zaczek, Barbara M.**, *Professor, Languages*. MA, Jagiellonian University (Poland), 1972; MA, 1988, PhD, 1992, University of Oregon
- Zagenczyk, Thomas J., Jr.**, *Associate Professor, Management*. BS, 2001, PhD, 2006, University of Pittsburgh
- Zamani, Zahra**, *Research Associate, School of Architecture*. BS, University of Tehran (Iran), 2006; MS, 2009, University of Tehran (Iran); PhD, North Carolina State University, 2013
- Zamora, Maureen**, *Senior Lecturer, Languages*. BA, 1994, MBA, 1998, Universidad Interamericana de Costa Rica (Costa Rica)
- Zamudio, Kelly R.**, *Adjunct Professor, Biological Sciences*. BS, University of California, Berkeley, 1991; University of Washington, 1996
- Zanbaka, Catherine A.**, *Adjunct Assistant Professor, School of Computing*. BS, 2000, MS, 2002, Georgia Institute of Technology; PhD, University of North Carolina-Charlotte, 2007
- Zantout, Dania M.**, *Visiting Assistant Professor, Mathematical Sciences*. BS, Beirut Arab University (Lebanon), 2001; MS, American University of Beirut (Lebanon), 2004; PhD, Clemson University, 2013
- Zapiola, Maria L.**, *Adjunct Associate Professor, Agricultural & Environmental Sciences*. BS, Pontifical Catholic University of Argentina (Argentina), 1997; MSc, 2004, PhD, 2009, Oregon State University
- Zavarin, Mavrik**, *Adjunct Professor, Environmental Engineering & Earth Sciences*. BS, 1993, PhD, 1999, University of California
- Zavertnik, Jean E.**, *Lecturer, School of Nursing*. BSN, Radford University, 1979; MN, University of South Carolina, 1983; DNP, Radford University, 2012
- Zehnder, Geoffrey W.**, *Coordinator, Integrated Pest Management & Sustainable Agriculture; Professor, Agricultural & Environmental Services*. BS, University of California-Davis, 1976; MS, 1980, PhD, 1984, University of California-Riverside
- Zhang, Guigen**, *Professor, Bioengineering*. BS, 1984, MS, 1987, Tongji University (China); PhD, Clemson University, 1994
- Zhang, Lingling**, *Assistant Professor, Public Health*. BL, Central University of Finance and Economics (China), 2000; MPA, Kansas State University, 2003; MS, Carnegie Mellon University, 2004; DS, Harvard University, 2011
- Zhang, Yanhua**, *Associate Professor, Languages*. BA, Beijing Normal University (China), 1983; MA, Chinese Academy of Social Sciences (China), 1986; MA, 1992, PhD, 1999, University of Hawaii
- Zhao, Huijuan**, *Assistant Professor, Mechanical Engineering*. BS, 2000, MS, 2002, Tsinghua University (China); PhD, University of Illinois, 2010
- Zhao, Xin**, *Assistant Professor, Mechanical Engineering*. BS, 2006, MS, 2008, Tsinghua University (China); PhD, Purdue University, 2014
- Zhebentyayeva, Tetyana N.**, *Research Associate Professor, CU Genomics Institute*. BS, 1977, MS, 1977, PhD, 2013, Leningrad State University (Russia)
- Zheng, Yi**, *Assistant Professor, Environmental Engineering & Earth Sciences*. BE, Fuzhou University (China), 2000; ME, Beijing University of Chemical Technology (China), 2003; PhD, University of California-Davis, 2007
- Zhu, Lin**, *Warren H. Owen Associate Professor, Electrical & Computer Engineering*. BS, 2000, MS, 2003, Tsinghua University (China); MS, 2004, PhD, 2008, California Institute of Technology
- Zile, Michael R.**, *Adjunct Professor, Bioengineering*. BA, Knox College, 1974; MD, Rush University Medical School, 1977
- Zimany, Valerie A.**, *Assistant Professor, Art*. BFA, University of the Arts, 1995; MFA, Kanazawa College of Art (Japan), 2002

Zinzow, Heidi M., Associate Professor, Psychology. BS, Duke University, 1998; MS, 2005, PhD, 2007, University of Georgia
 Zumbrennen, David A., Warren H. Owen-Duke Energy Professor, Mechanical Engineering. BME, University of Minnesota, 1977; MSME, 1984, PhD, 1988, Purdue University; PE
 Zungoli, Patricia A., Professor, Agricultural & Environmental Sciences. BS, 1974, MS, 1979, University of Maryland; PhD, Virginia Tech, 1982

FACULTY EMERITI

- Abbott, Albert G., Ph.D., Professor Emeritus of Genetics and Biochemistry
 Abney-Wilson, Linda Y., BS, County Extension Agent Emerita
 Acker, Thomas Waring, BS, County Extension Agent Emeritus
 Acorn, John Thomson, MFA, Chair and Professor Emeritus of Art
 Acton, James C., PhD, Stender Professor Emeritus of Food Science and Human Nutrition
 Adams, Clementina, PhD, Professor Emerita of Languages
 Adams, Jesse, III, MAgEd, Regional Director Emeritus
 Aitken, James Bruce, PhD, Professor Emeritus of Horticulture
 Alam, Khursheed, PhD, Professor Emeritus of Mathematical Sciences
 Albert, Harold Edward, PhD, Professor Emeritus of Political Science
 Albrecht, John E., PhD, Professor Emeritus of Animal and Veterinary Science
 Allen, Joe Frank, PhD, Professor Emeritus of Chemistry
 Allen, William H., PhD, Professor Emeritus of Biosystems Engineering
 Alston, Rowland Poole, Jr., MS, County Extension Agent Emeritus
 Alverson, David Roy, PhD, Professor Emeritus of Entomology, Soils, and Plant Sciences
 Anand, Subhash C., PhD, Professor Emeritus of Civil Engineering
 Anand, Vera Barata, MS, Professor Emerita of Engineering Graphics
 Anderson, Luther Perdee, PhD, Dean Emeritus, College of Agricultural Sciences; Professor Emeritus of Agronomy and Soils
 Armistead, Myra Ann, MA, Librarian Emerita
 Arnold, Edwin Pratte, MA, Professor Emeritus of German
 Ashley, Kathy Littlefield, MS, County Extension Agent Emerita
 Aspland, J. Richard, PhD, Professor Emeritus of Materials Science and Engineering
 Baird, Betty Evans, MS, County Extension Agent Emerita
 Baird, William V., PhD, Alumni Distinguished Professor and Professor Emeritus of Horticulture
 Ballard, Robert E., PhD, Professor Emeritus of Biological Sciences
 Barfield, Rayford E., PhD, Professor Emeritus of English
 Barkley, David L., PhD, Professor Emeritus of Applied Economics and Statistics
 Barlage, William Berdell, Jr., PhD, Associate Dean Emeritus, College of Engineering; Professor Emeritus of Chemical Engineering
 Barnes, Peter A., PhD, Professor Emeritus of Physics and Astronomy
 Barnett, Bobby Dale, PhD, Professor Emeritus of Poultry Science
 Baron, William, PhD, Professor Emeritus of Civil Engineering
 Barron, Charles Henson, DSc, Professor Emeritus of Chemical Engineering
 Barth, Clyde Lewis, PhD, Professor Emeritus of Agricultural and Biological Engineering
 Bass, Samuel David, County Extension Agent Emeritus
 Bauer, Larry L., PhD, Professor Emeritus of Applied Economics
 Bauld, Nelson Robert, Jr., PhD, Professor Emeritus of Mechanical Engineering and Engineering Mechanics
 Baxa, Earnest Granville, Jr., PhD, Professor Emeritus of Electrical and Computer Engineering
 Beard, John Nelson, Jr., PhD, Professor Emeritus of Chemical Engineering
 Beck, Mary McLean, PhD, Professor Emerita of the School of Agricultural, Forest, and Environmental Sciences
 Becker, Robert H., PhD, Professor Emeritus of Parks, Recreation, and Tourism Management
 Beckham Jr, Lewis R., BS, County Extension Agent Emeritus
 Beckwith, William Frederick, PhD, Professor Emeritus of Chemical Engineering
 Bednar, John C., PhD, Professor Emeritus of Languages
 Behery, Hassan Mohamed, PhD, Professor Emeritus of Textiles
 Bell, Lansford C., PhD, Professor Emeritus of Civil Engineering
 Bennett, Archie Wayne, PhD, Senior Vice Provost and Dean Emeritus of Graduate School; Professor Emeritus of Electrical and Computer Engineering
 Bennett, John Everett, PhD, Professor Emeritus of Electrical and Computer Engineering
 Berger, Leonard, PhD, Professor Emeritus of Psychology
 Beyerlein, Adolph Louis, PhD, Chair and Professor Emeritus of Chemistry
 Biga, Thomas Michael, MS, County Extension Agent Emeritus
 Bishop, Carl Barnes, PhD, Professor Emeritus of Chemistry
 Bishop, Eugene Harlan, PhD, Alumni Professor Emeritus of Mechanical Engineering
 Bishop, Muriel Boyd, PhD, Professor Emerita of Chemistry
 Black, John Olar, MS, Professor Emeritus of Agronomy and Soils
 Black, Jonathan, PhD, Professor Emeritus of Bioengineering
 Blackston, William Edward, BS, County Extension Agent Emeritus
 Blair, Dudley W., PhD, Director of MBA Program; Professor Emeritus of Economics
 Bodine, Ashby B., II, PhD, Professor Emeritus of Animal and Veterinary Sciences
 Book, Norman Loyd, PhD, Professor Emeritus of Construction Science and Management
 Bookmyer, Beverly Brandon, PhD, Professor Emerita of Physics and Astronomy
 Boone, James Edward, BS, County Extension Agent Emeritus
 Bosdell, Francis Alvin, MInEd, Professor Emeritus of Industrial Education
 Bose, Anil Kumar, PhD, Professor Emeritus of Mathematical Sciences
 Boswell, John Smith, Jr., County Extension Agent Emeritus
 Bowerman IV, William W., PHD, Professor Emeritus of Wildlife Ecology and Environmental Toxicology
 Box, Benton Holcombe, DF, Dean Emeritus of College of Forest and Recreation Resources; Professor Emeritus of Forest Resources
 Boykin, Joseph F., Jr., MS, Dean of Libraries and Librarian Emeritus
 Bradford, Garnett Lowell, PhD, Professor Emeritus of Agricultural and Applied Economics
 Bradshaw, David W., PhD, Professor Emeritus of Horticulture
 Brantley, Herbert, PhD, Head and Professor Emeritus of Parks, Recreation, and Tourism Management
 Brawley, Joel V., Jr., PhD, Alumni Distinguished Professor Emeritus of Mathematical Sciences
 Briscoe, Ida Carolyn, EdD, Professor Emerita of Curriculum and Instruction
 Brittain, Jere Alonzo, PhD, Professor Emeritus of Horticulture and Integrated Pest Management
 Brock, Julia Ashley, County Extension Director Emerita
 Brooks, Afton Dewayne, EdD, Professor Emeritus of Curriculum and Instruction
 Brown, Bennie Mae Porter, MEd, County Extension Agent Emerita
 Brown, Carolyn Scurry, PhD, Professor Emerita of Biochemistry
 Brown, Farrell Blenn, PhD, Interim Dean Emeritus of Graduate School; Professor Emeritus of Chemistry
 Brown, Russell H., PhD, Professor Emeritus of Civil Engineering
 Brown, Thomas M., PhD, Professor Emeritus of Entomology
 Brown, William Glynn, Jr., PhD, Professor Emeritus of Animal, Dairy, and Veterinary Sciences
 Brune, David E., PhD, Professor Emeritus of Agricultural and Biological Engineering
 Bryan, Edward Lewis, DBA, Professor Emeritus of Accounting
 Bryan, Jones Woodrow, DVM, Director of Livestock Poultry Health Emeritus
 Bryant, Hallman Bell, PhD, Professor Emeritus of English
 Buckner, Sam Levi, EdD, Professor Emeritus of Curriculum and Instruction
 Burch, Elmer Earl, Jr., PhD, Professor Emeritus of Business Administration and Mathematical Sciences
 Burg, Karen J.L., PhD, Hunter Endowed Chair and Professor Emerita of Bioengineering
 Burkett, Byron Verner, Jr., PhD, Professor Emeritus of Technology and Human Resource Development
 Burnett, G. Wesley, PhD, Professor Emeritus of Parks, Recreation, and Tourism Management
 Bussey, Marie Martin, County Extension Agent Emerita
 Butler, Chalmers M., PhD, Professor Emeritus of Entomology, Soils, and Plant Sciences
 Butler, John Harrison, EdD, Head and Professor Emeritus of Music
 Butler, John Kenrick, Jr., DBA, Professor Emeritus of Management
 Byars, Edward Ford, PhD, Executive Assistant Emeritus to the President; Professor Emeritus of Mechanical Engineering and Engineering Mechanics
 Caban, Jose, Masters, Professor Emeritus of Architecture
 Caldwell, Judith, PhD, Professor Emerita of Horticulture
 Caley, Paul Cochran, PhD, Professor Emeritus of Industrial Education
 Calvez, Daniel J., PhD, Professor Emeritus of Languages
 Campbell, Alice Young, MS, County Extension Agent Emerita
 Card, Edith Bryson, PhD, Professor Emerita of Music
 Carner, Gerald R., PhD, Professor Emeritus of Entomology, Soils, and Plant Sciences
 Carpenter, Earl Thomas, EdD, Head and Professor Emeritus of Agricultural Education
 Carroll, June Langley, BS, District Extension Director Emerita
 Carter, George E., Jr., PhD, Associate Dean of Undergraduate Academic Services and Professor Emeritus of Plant Pathology and Physiology
 Caskey, Claire Omar, MA, Professor Emeritus of English
 Castro, Walter Ernest, PhD, Professor Emeritus of Mechanical Engineering and Engineering Mechanics
 Cely, Joseph Eugene, MS, County Extension Agent Emeritus
 Chamberlain, Frances F., Masters, Professor Emerita of Planning, Development, Preservation and Landscape Architecture
 Chapin, Jay, PhD, Professor Emeritus of Entomology, Soils, and Plant Sciences
 Chapman, Stephen R., PhD, Professor Emeritus of Agronomy and Soils
 Charney, Mark, Ph.D., Professor Emeritus of Performing Arts
 Cheatham, Samuel Augustus, MAg, County Extension Agent Emeritus
 Chihaz, III, Charles P., MS, County Extension Agent Emeritus
 Chisman, James Allen, PhD, Professor Emeritus of Industrial Engineering
 Cholewinski, Frank Michael, PhD, Professor Emeritus of Mathematical Sciences
 Christenbury, Gerald Davis, PhD, Professor Emeritus of Agricultural and Biological Engineering
 Christenbury, Joyce Hvrol, MEd, Professor Emerita of Family and Youth Development
 Christoph, Laverne McKay, MA, Professor Emeritus of English
 Church, Ernest Y., MS, County Extension Agent Emeritus
 Claire, Alison L., PhD, Professor Emerita of Accounting
 Clark, James Edwin, PhD, Professor Emeritus of Civil Engineering
 Clark, Lawrence S., MA, Professor Emeritus of Accountancy
 Clarke, Richard L., PhD, Professor Emeritus of Management
 Clements, Stanley Gordon, Jr., Distinguished Area County Agent Emeritus
 Colacino, James M., PhD, Associate Professor Emeritus of Applied Economics and Statistics
 Colburn, Frances Louise, MLS, Librarian Emerita
 Cole, Christine W., PhD, Professor Emerita of Material Science and Engineering
 Cole, Spurgeon Northen, PhD, Professor Emeritus of Psychology
 Collier, John A., PhD, Professor Emeritus of Agricultural and Biological Engineering
 Collins, Donald Lynn, MS, Professor Emeritus of Planning and Landscape Architecture
 Collins, Joyce Smith, County Extension Agent Emerita
 Collins, Thomas Frank, MS, Professor Emeritus of Physics and Astronomy
 Connor-Greene, Patricia A., PhD, Alumni Professor Emerita of Psychology

- Conover, Richard Allan, Jr., PhD, Professor Emeritus of Parks, Recreation, and Tourism Management
- Cook, Wilton Pierce, PhD, Professor Emeritus of Horticulture
- Cooper, Melanie M., PhD, Professor Emeritus of Chemistry
- Costello, Gerald E., PhD, Professor Emeritus of Public Health Sciences
- Cover, Peggy H., MS, Librarian Emerita
- Craddock, Garnet Roy, PhD, Professor Emeritus of Agronomy and Soils
- Crader, Kelly Wayne, PhD, Professor Emeritus of Sociology
- Craig, Janet B., PhD, Associate Professor Emerita of Nursing
- Craig, Lynn G., MArch, Professor Emeritus of Architecture
- Cranston, Mechthild, PhD, Professor Emerita of French
- Crino, Michael D., PhD, Alumni Distinguished Professor Emeritus of Management
- Crosby, Birdie Raymond, Jr., MPA, County Extension Agent Emeritus
- Crosby, Margaree Seawright, EdD, Professor Emerita of Curriculum and Instruction
- Cross, Sydney A., MFA, Alumni Distinguished Professor Emerita of Art
- Crouch, James Page, EdD, Alumni Distinguished Professor Emeritus of Graphic Communications
- Cabbage, John R., BS, County Extension Agent Emeritus
- Culbertson, Carroll Preston, BS, Extension Regional Director Emeritus
- Culler-Hair, Margaret Ann, MS, County Extension Agent Emerita
- Cunningham, Bennie Lee, MS, Professor Emeritus of Agricultural Education
- Curtis, Jr., Charlie E., Ph.D., Professor Emeritus of Applied Economics and Statistics
- Dalla Mura, Richard Anthony, BS, County Extension Agent Emeritus
- Davis, James Richard, PhD, Professor Emeritus of Accounting
- Davis, John S., PhD, Professor Emeritus of Management
- Davis, Rose Jones, EdD, Professor Emerita of Family and Youth Development
- Davis, Ruby Sellers, MA, Professor Emerita of History
- Dawson, Daren M., PhD, Department Chair and McQueen Quattlebaum Professor Emeritus of Holcombe Department of Electrical and Computer Engineering
- Day, Frank Louis, MA, Professor Emeritus of English
- Day, Mary Sue, BS, County Extension Agent Emerita
- Deal, Elwyn Ernest, PhD, Assistant Director Emeritus for Extension and Research
- Dearing, Jr, Perino M., PhD, Professor Emeritus of Mathematical Sciences
- Delicio, Gail C., PhD, Associate Professor Emerita of Teacher Education
- DestMarteau, Darryl D, PhD, Professor Emeritus of Chemistry
- Dickens, Thomas L., PhD, Alumni Distinguished Professor Emeritus of Accounting
- Dickerson, Ottie Joseph, PhD, Head and Professor Emeritus of Plant Pathology and Physiology; State Plant Pathologist
- Dickey, Jean L., PhD, Professor Emerita of Biological Sciences
- Dickey, Joseph Freeman, PhD, Alumni Professor Emeritus of Animal, Dairy, and Veterinary Sciences
- Diefendorf, Russell Judd, PhD, McAlister Professor Emeritus of Ceramic Engineering
- Diehl, John R., PhD, Professor Emeritus of Animal and Veterinary Sciences
- Dillman, Buddy Leroy, PhD, Professor Emeritus of Agricultural and Applied Economics
- Dillon, Charles Ronald, PhD, Professor Emeritus of Botany
- Dillon, Howard, Jr., BS, County Extension Agent Emeritus
- Dimond, Thomas W., MFA, Professor Emeritus of Art
- Dinger, Dennis Russell, PhD, Professor Emeritus of Ceramic and Materials Engineering
- Dixon, Marvin Warren, PhD, Alumni Distinguished Professor Emeritus of Mechanical Engineering
- Doost, Roger K., PhD, Professor Emeritus of Accountancy
- Drake, Thomas L., PhD, Professor Emeritus of Electrical and Computer Engineering
- Drews, Michael J., PhD, Professor Emeritus of Materials Science and Engineering
- Dufault, Robert J., Ph.D., Professor Emeritus of Environmental Horticulture
- Duke, Albert Link, PhD, Professor Emeritus of Electrical and Computer Engineering
- Dukes, Geraldine Dorman, MEd, Extension Regional Director Emerita
- Duncan, Charles R., BS, County Extension Agent Emeritus
- Dunn, B. Allen, PhD, Director of Environmental Toxicology, Professor Emeritus of Forestry and Natural Resources
- Dunn, Charles Wythe, PhD, Professor Emeritus of Political Science
- DuRant, John Alexander, III, PhD, Professor Emeritus of Entomology
- Dyck, Lawrence A., PhD, Professor Emeritus of Biological Sciences
- Eaddy, Elvie Eskew, County Extension Agent Emerita
- Eaddy, Susan Tomlinson, BS, Distinguished County Agent Emerita
- Eargle, Jesse Claude, MS, Extension Regional Director Emeritus
- Edie, Danny D., PhD, Professor Emeritus of Chemical Engineering
- Edwards, Jane Snipes, County Extension Agent Emerita
- Edwards, Robert Lee, PhD, Professor Emeritus of Animal Science
- Efland, Thomas Daniel, MS, Associate Dean and Director Emeritus of Research, College of Commerce and Industry; Professor Emeritus of Textiles
- Egan, Clifton Scott Miller, MFA, Alumni Distinguished Professor Emeritus of Theatre
- Egan, Martin David, MS, Professor Emeritus of Construction Science and Management
- Elliot, Ralph D., PhD, Vice Provost for Off-Campus Distance and Continuing Education, Professor Emeritus of Economics
- Ellison, Michael S., PhD, Professor Emeritus of Materials Science and Engineering
- Elrod, Alvon Creighton, PhD, Professor Emeritus of Mechanical Engineering
- Elzerman, Alan W., PhD, Professor Emeritus of Environmental Engineering and Earth Sciences
- English, William Rockford, PhD, Associate Professor Emeritus of Forestry and Environmental Sciences
- Enser, Janet Elizabeth, BS, County Extension Agent Emerita
- Epps, Philip Olin, Area County Extension Agent Emeritus
- Eubanks, Isaac Dwaine, PhD, Professor Emeritus of Chemistry
- Eversole, Arnold George, PhD, Professor Emeritus of Forestry and Natural Resources
- Ezell, Dan Odell, PhD, Associate Director of Extension Emeritus
- Fain, Charles Clifford, PhD, Professor Emeritus of Ceramic Engineering
- Fairey, John Edward, III, PhD, Professor Emeritus of Biological Sciences
- Fallow, Jeralyn Kirkley, County Extension Agent Emerita
- Fanning, James Collier, PhD, Professor Emeritus of Chemistry
- Fendley, Timothy Thomas, PhD, Professor Emeritus of Aquaculture, Fisheries, and Wildlife
- Fennell, Robert E., PhD, Professor Emeritus of Mathematical Sciences
- Fernandez, Gaston Juan, PhD, Professor Emeritus of Spanish
- Fisk, William R., PhD, Professor Emeritus of Teacher Education
- Fitch, Lewis Thomas, PhD, Alumni Professor Emeritus of Electrical and Computer Engineering
- Fitzsimons, Frank Lockwood, III, MS, County Extension Agent Emeritus
- Fjeld, Robert A., PhD, Dempsey Professor of Waste Management and Professor Emeritus of Environmental Engineering and Earth Sciences
- Flanigan, Jackson L., PhD, Professor Emeritus of Leadership, Counselor Education, and Human Organizational Development
- Foley, Charles William, PhD, Professor Emeritus of Animal and Veterinary Sciences
- Foltz, Jeffrey W., PhD, Professor Emeritus of Forestry and Natural Resources
- Fones, Shelley White, PhD, Professor Emerita of Elementary and Early Childhood Education
- Foster, Carolyn Ezell, MA, Professor Emerita of English
- Foster, Ida Marie Sloan, MSLS, Librarian Emerita
- Franklin, Joyce Byrd, MS, County Extension Agent Emerita
- Franklin, Ralph E., PhD, Professor Emeritus of Crop and Soil Environmental Science
- Frederick, John Arthur, MS, County Extension Agent Emeritus
- Freeman, Edwin Armistead, PhD, Professor Emeritus of Music
- Friedlob, George Thomas, PhD, Professor Emeritus of Accountancy
- Fuhr, Donald Lee, EdD, Professor Emeritus of Counseling and Educational Leadership
- Gable, Paul Kistler, Jr., BA, Assistant Director of Extension Emeritus
- Gaddis, Joseph Leo, PhD, Professor Emeritus of Mechanical Engineering
- Gadson, Tyron, BS, County Extension Agent Emeritus
- Gahan, Lawrence Willard, PhD, Alumni Distinguished Professor of Parks, Recreation, and Tourism Management
- Galluscio, Eugene Hugo, PhD, Professor Emeritus of Psychology
- Galyean, Ronald D., PhD, Professor Emeritus of Food Science and Human Nutrition
- Gangemi, Joseph D., PhD, Director of Institute for Nutraceutical Research and Professor Emeritus of Biological Sciences
- García, Ric A., PHD, Associate Professor Emeritus of Biological Sciences
- Garner, Peggy, PhD, Professor Emerita of Mathematical Sciences
- Garrett, Thomas R., ME, Instructor Emeritus of Agricultural and Biological Engineering
- Gaskins, Judith Collins, MS, County Extension Agent Emerita
- Gauthreaux, Sidney A., PhD, Professor Emeritus of Biological Sciences
- Geddes, Doreen, PhD, Professor Emerita of Communication Studies
- Geldard, John Francis, PhD, Professor Emeritus of Chemistry
- Gettys, William Edward, PhD, Professor Emeritus of Physics
- Gilchrist, Ralph Wayne, PhD, Professor Emeritus of Electrical and Computer Engineering
- Gilliland, Bobby Eugene, PhD, Special Assistant Emeritus to the President; Professor Emeritus of Electrical and Computer Engineering
- Gillis, Victoria R., PhD, Professor Emerita of Teacher Education
- Gilreath, John Atkins, MS, Professor Emeritus of Physics
- Gimenez, Tomas, Professor Emeritus of Animal and Veterinary Sciences
- Glover, Judith Lyles, BA, County Extension Agent Emerita
- Gooding, Charles H., PhD, Professor Emeritus of Chemical and Biomolecular Engineering
- Goodwin, Jr., James G., PhD, Professor Emeritus of Chemical and Biomolecular Engineering
- Gordon, David B., PhD, Professor Emeritus of Economics
- Goree, James Gleason, PhD, Centennial Professor Emeritus; Professor Emeritus of Mechanical Engineering and Engineering Mechanics
- Gorsuch, Clyde S., PhD, Professor Emeritus of Entomology
- Gossett, Billy Joe, PhD, Professor Emeritus of Crop and Soil Environmental Science
- Goswami, Bhuvnesh C., PhD, Professor Emeritus of Materials Science and Engineering
- Goswami, Dixie Gooch, MA, Professor Emerita of English
- Graham, Henry Willingham, PhD, Professor Emeritus of Physics
- Grady, C. P. Leslie, Jr., PhD, R. A. Bowen Professor Emeritus of Environmental Engineering and Science
- Graham, W. Doyce, Jr., PhD, Professor Emeritus of Crop and Soil Environmental Science
- Gray, Charles Harmon, BA, County Extension Agent Emeritus
- Gray, Furman Ray, MS, Associate Professor Emeritus of Accounting
- Gray, Gordon Walter, EdD, Dean Emeritus, College of Education
- Gray, Hugh Brunson, BS, County Extension Agent Emeritus
- Green, Robert P., EdD, Alumni Distinguished Professor Emeritus of Teacher Education
- Gregory, Kay Rish, County Extension Agent Emerita
- Gresham, Charles A., PhD, Associate Professor Emeritus of Forestry and Natural Resources
- Griffin, Barbara, PhD, Professor Emerita of Leadership, Technology, and Counselor Education
- Griffin, Deuel Norton, MAT, Professor Emeritus of English
- Griffin, Randall Parrish, MS, Professor Emeritus of Entomology
- Griffin, Villard Stuart, Jr., PhD, Professor Emeritus of Geology
- Grigsby, David, PhD, Professor Emeritus of Management

- Grimes, Lawrence W., PhD, Professor Emeritus of Applied Economics and Statistics
- Grossman, Harold C., PhD, Associate Professor Emeritus of School of Computing
- Grove, Harold Jesse, MS, Associate Professor Emeritus of Parks, Recreation, and Tourism Management
- Gulari, Esin, PhD, Professor Emerita of Materials Science and Engineering and Dean, College of Engineering and Science
- Guynn, David C., PhD, Professor Emeritus of Forestry and Natural Resources
- Haertling, Gene Henry, PhD, Bishop Distinguished Professor Emeritus of Ceramic Engineering
- Hall, Basil Edwin, MInEd, Professor Emeritus of Art
- Hall, Michelle A., PhD, Associate Professor Emerita of Animal and Veterinary Sciences
- Ham, Donald L., PhD, Professor Emeritus of Forest and Natural Resources
- Hamby, John Vernon, PhD, Professor Emeritus of Education
- Hammig, Michael D., PhD, Professor Emeritus of Agricultural Economics
- Hammitt, William E., Professor Emeritus of Parks, Recreation, and Tourism Management
- Hammond, Joseph Langhorne, PhD, Professor Emeritus of Electrical and Computer Engineering
- Haque, Mary B. Taylor, M.L.A., Professor Emerita of Horticulture
- Harder, Lillian U., MM, Professor Emerita of Music
- Hare, Eleanor O., PhD, Associate Professor Emerita of Computer Science
- Hare, William R., Jr., PhD, Professor Emeritus of Mathematical Sciences
- Harris, Carolyn Martin, MS, County Extension Agent Emerita
- Harris, Harold M., Jr., PhD, Professor Emeritus of Applied Economics and Statistics
- Harris, Maureen, MLS, Librarian Emerita
- Harrison, James William, Jr., PhD, Professor Emeritus of Electrical and Computer Engineering
- Harvey, Hilliard G., MS, County Extension Agent Emeritus
- Harvey, Lawrence Harmon, PhD, Professor Emeritus of Agronomy and Soils
- Harwell, Richard Lynn, PhD, Professor Emeritus of Agricultural and Applied Economics
- Haselton, George Montgomery, PhD, Professor Emeritus of Geology
- Hash, John Alex, EdD, Professor Emeritus of Agricultural Education
- Hayes, John C., PhD, Professor Emeritus of Agricultural and Biological Engineering
- Haymond, Jacqueline Landis, PhD, Professor Emerita of Forest Resources
- Hays, Ruth Lanier, PhD, Professor Emerita of Biological Sciences
- Hays, Sidney Brooks, PhD, Head and Professor Emeritus of Entomology
- Hedden, Roy, PhD, Professor Emeritus of Forestry and Natural Resources
- Hedetniemi, Stephen T., PhD, Professor Emeritus of Computer Science
- Helms, Carl Wilbert, PhD, Professor Emeritus of Zoology
- Helms, Doris R., PhD, Provost and Vice President for Academic Affairs Emerita; Professor Emerita of Biological Sciences
- Helsel, Beth W., MS, Librarian Emerita
- Hendrix, William Herlie, PhD, Head and Professor Emeritus of Management
- Henricks, Donald Maurice, PhD, Chair and Professor Emeritus of Animal and Veterinary Sciences
- Heusinkveld, Paula R., Ph.D., Professor Emerita of Languages
- Hilderman, Richard H., PhD, Professor Emeritus of Genetics and Biochemistry
- Hill, Hoke S., Jr., PhD, Professor Emeritus of Mathematical Sciences
- Hill, James Riley, Jr., PhD, Professor Emeritus of Animal, Dairy, and Veterinary Sciences
- Hiller, Howard Hugh, MS, County Extension Agent Emeritus
- Hillgoss, Susan J., PhD, Professor Emerita of English
- Hiott, Floyd Berry, Jr., BS, County Extension Agent Emeritus
- Hipps, Opal Shepard, EdD, Professor Emerita of Nursing
- Hochheimer, Laura, PhD, Professor Emerita of Music
- Hodges, Barbara Latimer, MEd, County Extension Agent Emerita
- Hogan, Robert, MArch, Professor Emeritus of Architecture
- Holaday, Bonnie J., PhD, Professor Emerita of Nursing
- Holder, Barbara J., PhD, Professor Emerita of Nursing
- Holly, Edward Jens, MA, Librarian Emeritus
- Holmes, Paul Thayer, PhD, Professor Emeritus of Mathematical Sciences
- Holt, Albert Hamilton, PhD, Professor Emeritus of English
- Hon, David N. S., PhD, Professor Emeritus of Forest Resources
- Hood, Clarence Elam, Jr., PhD, Professor Emeritus of Agricultural and Biological Engineering
- Hood, William Michael, PhD, Professor Emeritus of Entomology
- Hook, Donal Delose, PhD, Professor Emeritus of Forestry
- Horton, Paul Mackey, PhD, Professor and Assistant Director of Extension Emeritus
- Horton, Robert M., EdD, Professor Emeritus of Teacher Education
- House, Verne Wasden, PhD, Professor Emeritus of Agricultural and Applied Economics
- Howard, Gordon Edward, PhD, Professor Emeritus of Parks, Recreation and Tourism Management
- Howe, Linda A., PhD, Associate Professor Emerita of Nursing
- Howell, Nelda Kay, MEd, Professor Emerita of Home Economics
- Hoyle, Elizabeth H., Professor Emerita of Packaging Science
- Hubbard, Julius Clifford, Jr., MS, Alumni Professor Emeritus of Textiles
- Hubing, Todd H., PhD, Professor Emeritus of Holcombe Department of Electrical and Computer Engineering
- Hudson, Larry Wilson, PhD, Professor Emeritus of Animal and Veterinary Sciences
- Hudson, Mark Richards, MFA, Professor Emeritus of Art
- Huey, Cecil O., Jr., PhD, Professor Emeritus of Mechanical Engineering
- Huffman, John W., PhD, Professor Emeritus of Chemistry
- Hughes, Buddy Lee, PhD, Professor Emeritus of Animal and Veterinary Sciences
- Hughes, Robbie Blankenship, EdD, Professor Emerita of Nursing
- Hunter, Janis Gerrard, Distinguished County Agent Emerita
- Hunter, Orren Franklin, Sr., MS, Professor Emeritus of Textiles, Fiber, and Polymer Science
- Hunter, Robert Howard, MFA, Professor Emeritus of Visual Arts
- Hupp, Harold D., PhD, Professor Emeritus of Animal and Veterinary Sciences
- Hurley, Joni K., PhD, Associate Professor Emerita of Languages
- Hurt, N. Jane, Ph.D., Associate Professor Emerita of Architecture
- Hutton, Dale Jovan, MArch, Professor Emeritus of Architecture
- Idol, John Lane, Jr., PhD, Alumni Professor Emeritus of English
- Irwin, John Waltrip, MAgEd, Extension Animal Scientist Emeritus
- Isbell, Clinton H., EdD, Professor Emeritus of Leadership, Technology, and Counselor Education
- Jacobi, Martin J., PhD, Professor Emeritus of English
- Jacobs, David P., PhD, Professor Emeritus of School of Computing
- Jacques, John David, MPhil, Professor Emeritus of Architecture
- James, Ann E., PhD, Professor Emerita of Parks, Recreation, and Tourism Management
- James, Willie Romando, PhD, Professor Emeritus of Family and Youth Development
- James, Zoe Seabrook, MAgEd, Distinguished County Extension Agent Emerita
- Jamison, Robert E., PhD, Professor Emeritus of Mathematical Sciences
- Jarvis, James P., PhD, Professor Emeritus of Mathematical Sciences
- Jenkins, Gloria, MS, County Extension Agent Emerita
- Jenkins, Thomas C., PhD, Professor Emeritus of Animal & Veterinary Sciences
- Jensen, Arthur Kenneth, PhD, Professor Emeritus of Vocational-Technical Education
- Johnson, Albert W., PhD, Professor Emeritus of Entomology, Soils, and Plant Sciences
- Johnson, Bruce C., MS, County Extension Agent Emeritus
- Johnson, Ronnie J., PhD, Professor Emeritus of Agricultural, Forest and Environmental Sciences
- Johnson, Ruby Carolyn, MS, County Extension Agent Emerita
- Johnson, Steven D., MS, Librarian Emeritus
- Jones, Emory Valentine, MS, County Extension Director Emeritus
- Jones, Jack Edenfield, PhD, Professor Emeritus of Poultry Science
- Jones, Joe Kenneth, BS, State Leader Emeritus of 4-H and Youth Development Programs; Professor Emeritus of Animal Science
- Jones, W. A., Jr., MA, County Extension Director Emeritus
- Jordan, Johnny Wayne, PhD, Professor Emeritus of Agricultural and Applied Economics
- Josey, James Larry, PhD, Professor Emeritus of Civil Engineering
- Kahl, Kandice H., PhD, Professor Emerita of Agricultural and Applied Economics
- Kanet, John Joseph, PhD, Professor Emeritus of Management
- Keener, John Leroy, Jr., County Extension Agent Emeritus
- Keese, Lee Shirley, BS, County Extension Agent Emeritus
- Keinath, Thomas M., PhD, Dean, College of Engineering and Science and Professor Emeritus of Environmental Engineering
- Keller, Deloris Olivia, Distinguished County Agent Emerita
- Keller, Don F., PhD, Professor Emeritus of Leadership, Technology, and Counselor Education
- Keller, Frederick Jacob, PhD, Professor Emeritus of Physics
- Kelly, Mary Ann, EdD, Professor Emerita of Nursing Science
- Kenelly, John Willis, PhD, Alumni Professor Emeritus of Mathematical Sciences
- Kennedy, John M., Professor Emeritus of Mechanical Engineering
- Kennedy, William Joseph, PhD, Professor Emeritus of Industrial Engineering
- Kessler, George D., PhD, Professor Emeritus of Forest and Natural Resources
- Key, Jennifer D., PhD, Professor Emerita of Mathematical Sciences
- Kilbourne, William E., PhD, Professor Emeritus of Marketing
- Kimbler, Delbert L., Jr., PhD, Professor Emeritus of Industrial Engineering
- Kinder, Andrew Jackson, BA, County Extension Agent Emeritus
- King, Donnie R., Ph.D., Professor Emeritus of Biosystems Engineering
- King, Grady Ansel, Jr., PhD, Professor Emeritus of Horticulture
- King, Samuel C., PhD, Professor Emeritus of Languages
- Kingman, Alta Randall, PhD, Professor Emeritus of Horticulture
- Kingsland, Graydon Chapman, Sr., PhD, Professor Emeritus of Plant Pathology and Physiology
- Kishimoto, Yuji, Ph.D., Professor Emeritus of Architecture
- Kissam, John Benjamin, PhD, Professor Emeritus of Entomology
- Klein, Richard Harold, PhD, Professor Emeritus of Finance
- Kline, Ellis Lee, PhD, Professor Emeritus of Microbiology and Molecular Medicine
- Kline, Judith Spiers, MS, Professor Emerita of Family and Youth Development
- Kline, Priscilla Mackenzie, EdD, Professor Emerita of Nursing Science
- Knapp, Halina T., PhD, Professor Emerita of Crop and Soil Environmental Sciences
- Knapp, Ronald James, PhD, Alumni Professor Emeritus of Sociology
- Knox, Sarah Stewart, BS, Associate District Extension Leader Emerita; Professor Emerita of Home Economics
- Kohl, Michael F., MLS, Librarian Emeritus
- Komo, John, PhD, Professor Emeritus of Electrical and Computer Engineering
- Koon, George W., PhD, Professor Emeritus of English
- Kostreva, Robert M., PhD, Professor Emeritus of Mathematical Sciences
- Kozma, Ernest Joseph, EdD, Professor Emeritus of Education
- Kunkel, Mary E., Ph.D., Professor Emerita of Food Science and Human Nutrition
- Kurfess, Thomas, PhD, Professor Emeritus of Mechanical Engineering
- Labecki, Geraldine, EdD, Dean Emerita, College of Nursing; Professor Emerita of Nursing
- LaForge, Mary C., PhD, Professor Emerita of Marketing
- LaForge, Robert L., PhD, Alumni Distinguished Professor Emeritus of Management
- Lambert, Barbara Sherrill, BS, County Extension Agent Emerita
- Lambert, Jerry Roy, PhD, Professor Emeritus of Agricultural and Biological Engineering
- Lambert, Robert Stansbury, PhD, Professor Emeritus of History
- Lane, Carl Leaton, PhD, Professor Emeritus of Forestry

- Lane, Samuel, County Extension Agent Emeritus
- Laskar, Renu C., PhD, Professor Emerita of Mathematical Sciences
- Lathrop, Jay Wallace, PhD, Professor Emeritus of Computer Engineering
- LaTorre, Jeuel Gillam, MA, Professor Emeritus of Mathematical Sciences
- Law, E. Harry, PhD, Professor Emeritus of Mechanical Engineering
- Lawson, John W., PhD, Professor Emeritus of Biological Sciences
- Layne, Desmond R., PhD, Professor Emeritus of Pomology
- Leap, Terry L., PhD, Professor Emeritus of Management
- Leathrum, James Frederick, PhD, Professor Emeritus of Electrical and Computer Engineering
- LeBlanc, Janet B., Ph.D., Associate Professor Emerita of Art
- Lee, Andy W., PhD, Professor Emeritus of Forestry
- Lee, Bertrand I., PhD, Professor Emeritus of Materials Science and Engineering
- Lee, Daniel Dixon, Jr., PhD, Professor Emeritus of Animal and Veterinary Sciences
- Lee, Evelyn J., Professor Emerita of Nursing
- Lee, Peter Roald, MArch, Alumni Distinguished Professor Emeritus of Architecture
- Leigh, Herbert D., III, PhD, Professor Emeritus of Materials Science and Engineering
- Leonard, Michael S., PhD, Professor Emeritus of Industrial Engineering
- Leonard, William H., PhD, Professor Emeritus of Teacher Education
- Leuschner, William Albert, PhD, Professor Emeritus of Forest Resources
- Lew, William W., PhD, Emeritus Professor of Art
- Lewis, Gordon, PhD, Professor Emeritus of Ceramic and Materials Engineering
- Lewis, Stephen A., PhD, Professor Emeritus of Entomology, Soils, and Plant Sciences
- Ligon, James Teddie, PhD, Professor Emeritus of Agricultural and Biological Engineering
- Linville, Dale Edward, PhD, Professor Emeritus of Agriculture and Bioengineering
- Lippert, Robert M., PhD, Professor Emeritus of Entomology, Soils, and Plant Sciences
- Locke, Ernest Lyle, County Extension Agent Emeritus
- Logan, Barbara N., Professor Emerita of Nursing
- Louderback, Joseph Girard, PhD, Professor Emeritus of Accounting
- Lovedahl, Gerald Grey, PhD, Professor Emeritus of Technology and Human Resource Development
- Loyd, Max Ira, PhD, Professor Emeritus of Agricultural and Applied Economics
- Lukawecki, Stanley Michael, PhD, Professor Emeritus of Mathematical Sciences
- Lumpkin, Oliver Reese, PhD, Professor Emeritus of Education
- Lupo, Barbara H., MS, County Extension Agent Emerita
- Macy, Jacques Berr, MAT, Professor Emeritus of French
- Madison, Alan Wayne, PhD, Associate Professor Emeritus of School of Computing
- Maloney, Michael T., PhD, Professor Emeritus of Economics
- Manley, Donald G., Professor Emeritus of Entomology
- Manson, Joseph R., PhD, Professor Emeritus of Physics and Astronomy
- Marbut, Samuel Alexander, BS, Professor Emeritus of Forestry
- Marsinko, Allan, Professor Emeritus of Forestry and Natural Resources
- Martin Jr, Joseph A., BS, County Extension Agent Emeritus
- Martin, John Campbell, PhD, Professor Emeritus of Electrical and Computer Engineering
- Martin, Mary Virginia, MA, Extension Associate Emerita
- Martini, Joseph Albert, PhD, Professor Emeritus of Agronomy and Soils
- Mathews, Andrew Clark, PhD, Professor Emeritus of Botany
- Mathis, Lee Terrell, Jr., Distinguished County Agent Emeritus
- Matthews, James Edward, EdD, Dean Emeritus, College of Education; Professor Emeritus of Education
- Matthewson, Charles, PhD, Chair and Professor Emeritus of Construction Science and Management
- Maurer, Donald Edwin, EdD, Professor Emeritus of Industrial Education
- Maurice, Denzil V., Ph.D., Professor Emeritus of Animal and Veterinary Sciences
- Mazur, Anthony Robert, PhD, Professor Emeritus of Crop and Soil Environmental Science
- McCullough, Joe Lawrence, PhD, Professor Emeritus of Philosophy
- McConnell, James Calvin, Jr., PhD, Professor Emeritus of Animal and Veterinary Sciences
- McCormac, Jack Clark, LLD, Alumni Professor Emeritus of Civil Engineering
- McCormick, Robert M., PhD, Professor Emeritus of Economics
- McCutcheon, Gloria S., PhD, Professor Emerita of Entomology, Soils, and Plant Sciences
- McDaniel, Martha Huggins, Area County Extension Agent Emerita
- McDowell, Helen Camp, BA, County Extension Agent Emerita
- McElreath, Robert B., PhD, Professor Emeritus of Finance
- McGregor, Rob Roy, Jr., PhD, Professor Emeritus of French and Latin
- McGuire, Francis A., PhD, Alumni Distinguished Professor Emeritus of Parks, Recreation, and Tourism Management
- McInnis, Thomas McLeod, Jr., PhD, Professor Emeritus of Biological Sciences
- McKale, Donald M., PhD, Class of 1941 Memorial and Professor Emeritus of History
- McLaughlin, John Joseph, PhD, Professor Emeritus of English
- McLean, Edward Lee, PhD, Professor Emeritus of Agricultural and Applied Economics
- McLellan, Margaret K., PhD, Associate Professor Emerita of Parks, Recreation, and Tourism Management
- McNatt, Jo Ann, PhD, Professor Emerita of French
- McNulty, Peter J., PhD, Professor Emeritus of Physics and Astronomy
- Melshimer, Stephen S., PhD, Professor Emeritus of Chemical Engineering
- Melton, Judith M., PhD, Associate Dean and Professor Emerita of Languages
- Melton, Tony, BS, County Extension Agent Emeritus
- Menke, Warren Wells, PhD, Professor Emeritus of Management
- Miller, Ansel Eldon, PhD, Professor Emeritus of Forest Resources
- Miller, Donald Piguet, PhD, Professor Emeritus of Physics
- Miller, James A., PhD, Associate Professor Emeritus of History
- Miller, James Cleo, Jr., PhD, State Extension Leader Emeritus
- Miller, Robert Walker, Jr., PhD, Professor Emeritus of Plant Pathology and Physiology
- Miller, Stephen E., Professor Emeritus of Applied Economics and Statistics
- Miller, Yvonne Holliday, MS, Staff Development Specialist Emerita
- Mixon, Robert Floyd, MA, Professor Emeritus of Spanish
- Molz, Fred J., III, Distinguished Scientist and Professor Emeritus, Environmental Engineering and Earth Sciences
- Montanucci, Richard R., PhD, Associate Professor Emeritus of Biological Sciences
- Moran, Ronald Wesson, PhD, Associate Dean Emeritus, College of Architecture, Arts, and Humanities; Professor Emeritus of English
- Morr, Charles Vernon, PhD, Stender Professor Emeritus of Food Science
- Morris, Michael A., PhD, Professor Emeritus of Political Science
- Morse, John C., PhD, Professor Emeritus of Entomology, Soils, and Plant Sciences
- Moss, William F., PhD, Alumni Distinguished Professor Emeritus of Mathematical Sciences
- Moyle, David D., PhD, Associate Professor Emeritus of Bioengineering and Physics
- Mullins, Joseph Chester, PhD, Professor Emeritus of Chemical Engineering
- Munson, Priscilla G., MLS, Librarian Emeritus
- Murdoch, Janice W., PhD, Professor Emerita of Psychology and Vice Provost and Dean of Undergraduate Studies
- Murrow, Elizabeth Jean, PhD, Professor Emerita of Nursing
- Nance, John William, BAg, County Extension Agent Emeritus
- Newton, Alfred Franklin, EdD, Head and Professor Emeritus of Industrial Education
- Nicholas, David M., Jr., PhD, Kathryn and Calhoun Lemon Professor Emeritus of History
- Nix, Larry Edward, Professor Emeritus of Forestry and Natural Resources
- Noblet, Gayle P., PhD, Professor Emerita of Biological Sciences
- Nocks, Barry C., Ph.D., Professor Emeritus of Planning, Development, and Preservation Landscape Architecture
- Nowack, Robert F., LLD, Alumni Professor Emeritus of Civil Engineering
- Nunnery, Henry Grady, III, MAg, County Extension Agent Emeritus
- Nyankori, James C. O., PhD, Professor Emeritus of Agriculture Economics
- Odom, Stephen, Jr., MS, County Extension Director Emeritus
- Ogle, Wayne Leroy, PhD, Professor Emeritus of Horticulture
- Oglesby, Frances Madelynn, PhD, Professor Emerita of Nursing
- Okafor, Chinyelu B., Assistant Professor Emeritus, Public Health Sciences
- Olson, Larry W., Ph.D., Associate Professor Emeritus of Animal and Veterinary Sciences
- Owens, Emma M., PhD, Professor Emeritus of Curriculum and Instruction
- Owens, Rameth Richard, PhD, Professor Emerita of History
- Owens, Walton Harrison, Jr., PhD, Professor Emeritus of Political Science
- Owings, Marvin Alpheus, PhD, Head and Professor Emeritus of English
- Oxendine, Laval, MS, County Extension Agent Emeritus
- Oxner, John W., MS, County Extension Agent Emeritus
- Padgett, Adrian Lewis, MS, Professor Emeritus of Agricultural Economics and Rural Sociology, Pee Dee Research and Education Center
- Padilla, Michael J., PhD, Professor Emeritus of Teacher Education
- Page, Edward W., III, PhD, Professor Emeritus of Computer Science
- Palmer, James Howell, PhD, Professor Emeritus of Agronomy and Soils
- Pardue, Fred Eugene, PhD, Professor Emeritus of Animal, Dairy, and Veterinary Sciences
- Pardue, John Cecile, Jr., BS, Area County Extension Agent Emeritus
- Park, Laretta Irene, PhD, Professor Emerita of Psychology
- Parker, David Andrew, MS, County Extension Agent Emeritus
- Parks, Clyde Leonard, PhD, Professor Emeritus of Agronomy and Soils
- Parks, Thomas Ilon, PhD, Professor Emeritus of Educational Leadership
- Pate, Dove Henry, Jr., EdD, Professor Emeritus of Technology and Human Resource Development
- Paul, Catherine E., PhD, Professor Emerita of English
- Pearson, L. Wilson, PhD, Professor Emeritus of Electrical and Computer Engineering
- Peck, John Charles, PhD, Professor Emeritus of Computer Science
- Pennscott, William Walter, EdD, Professor Emeritus of Education
- Peppers, Larry G., PhD, Professor Emeritus of Sociology
- Perry, Philip Rodney, MAg, County Extension Agent Emeritus
- Pertuit, Alton Joseph, Jr., PhD, Professor Emeritus of Horticulture
- Peters, Chris L., PhD, Associate Professor Emeritus of Teacher Education
- Pinkerton, Bruce W., PhD, Professor Emeritus of Entomology, Soils, and Plant Sciences
- Pipkins, Toni Scott, BS, Extension Associate Emerita
- Pivorun, Edward B., PhD, Professor Emeritus of Biological Sciences
- Platts, Rebecca Gaines, BA, County Extension Director Emerita
- Polk, George Merritt, Jr., MArch, Professor Emeritus of Architecture
- Porter, Nancy M., PhD, Professor Emerita of Family Outreach
- Potts, Thomas D., PhD, Professor Emeritus of Parks, Recreation, and Tourism Management
- Powell, Gary L., PhD, Professor Emeritus of Genetics and Biochemistry
- Price, Dawn Louisa, BS, County Extension Agent Emerita
- Privette, Charles Victor, Jr., MS, Professor Emeritus of Agricultural and Biological Engineering
- Proctor, Thomas Gilmer, PhD, Professor Emeritus of Mathematical Sciences
- Quisenberry, Virgil L., Ph.D., Professor Emeritus of Agronomy and Soils

- Rack, Henry J., PhD, Professor Emeritus of Materials Science and Engineering
- Rajapakse, Nihal C., Ph.D., Professor Emeritus of Environmental Horticulture
- Ransom, Rosa Mitchell, MS, County Extension Agent Emerita
- Rathwell, P. James, PhD, Professor Emeritus of Applied Economics and Statistics
- Ray, John Robert, PhD, Professor Emeritus of Physics and Astronomy
- Reamer, Larry Donald, MS, Professor Emeritus of Forestry
- Reel, Jerome V., Jr., PhD, Senior Vice Provost, University Historian and Professor Emeritus of History
- Reese, Richard M., PhD, Professor Emeritus of Marketing
- Regnier, Ireland Goldsmith, MFA, Professor Emeritus of Visual Arts
- Reneke, James A., PhD, Professor Emeritus of Mathematical Sciences
- Revis-Wagner, Kenyon C., PhD, Professor Emeritus of Biological Sciences
- Rhodes, Billy Beryl, PhD, Professor Emeritus of Horticulture
- Rice, Richard W., PhD, Associate Professor Emeritus of Chemical and Biomolecular Engineering
- Richardson, Eleanor Joyce, MS, Professor Emerita of Family and Youth Development
- Richardson, John Coakley, EdD, Professor Emeritus of Special Education
- Ridley, John Davis, MS, Professor Emeritus of Horticulture
- Rife, Lawrence Albert, MA, Professor Emeritus of Mathematical Sciences
- Riley, Barbara Brunson, County Extension Agent Emerita
- Riley, Helene M., PhD, Alumni Distinguished Professor and Professor Emerita of Languages
- Riley, Melissa B., PhD, Professor Emerita of Entomology, Soils, and Plant Sciences
- Roberts, William Russell, MS, Professor Emeritus of 4-H and Youth Development
- Robinette, David Lamar, PhD, Professor Emeritus of Forest Resources
- Robinson, Lou Johnson, BA, County Extension Agent Emerita
- Robinson, Vernon Lee, PhD, Professor Emeritus of Forest Resources
- Rogers, Clarence D., PhD, Swetenburg Professor Emeritus of School of Materials Science and Engineering
- Rogers, Ernest Brasington, Jr., MS, Professor Emeritus of Agricultural Education
- Rollin, Lucy Waddey, PhD, Professor Emeritus of English
- Rollin, Roger Best, PhD, Lemon Professor Emeritus of Literature
- Rudisill, Carl Sidney, PhD, Professor Emeritus of Mechanical Engineering
- Rudowski, Victor Anthony, PhD, Professor Emeritus of English
- Ruff, William James, BS, County Extension Agent Emeritus
- Ruggles, Janice Camlin, County Extension Agent Emerita
- Ruppert, Edward Ernst, PhD, Professor Emeritus of Biological Sciences
- Russell, C. Bradley, PhD, Professor Emeritus of Mathematical Sciences
- Russell, Linda Latimer, MEd, Extension Regional Director Emerita
- Ryan, Daniel Leo, PhD, Professor Emeritus of Engineering Graphics
- Sabin, Guy Edward, MF, Professor Emeritus of Forest Resources
- Savitsky, George Boris, PhD, Professor Emeritus of Chemistry
- Sawyer, Corinne Holt, PhD, Professor Emerita of English
- Sawyer, Raymond C., PhD, Professor Emeritus of Theatre
- Schiff, Scott D., PhD, Professor Emeritus of Civil Engineering
- Schindler, James E., PhD, Professor Emeritus of Biological Sciences
- Schneider, Raymond K., MBA, Associate Professor Emeritus of Construction Science & Management
- Schoutlies, Calvin L., Ph.D., Emeritus Professor of Entomology, Soils and Plant Sciences
- Schwartz, Arnold Edward, PhD, Dean Emeritus of Graduate School; Professor Emeritus of Civil Engineering
- Schwedler, Thomas E., PhD, Associate Dean and Professor Emeritus of Biological Sciences
- Scott, John Marshall, County Extension Agent Emeritus
- Screen, Arnold, BS, County Extension Agent Emeritus
- Sellers, Harold Calvin, BSIE, Professor Emeritus of Computer Science
- Senn, David James, PhD, Professor Emeritus of Psychology
- Senn, Louie Hampton, Jr., PhD, Director Emeritus of Regulatory and Public Service Programs
- Senn, Taze Leonard, PhD, Head and Professor Emeritus of Horticulture
- Sender, Herman F., PhD, Associate Professor Emeritus of Mathematical Sciences
- Seo, Kenzo, PhD, Professor Emeritus of Mathematical Sciences
- Shelburne, Victor B., PhD, Professor Emeritus of Forestry and Natural Resources
- Shelton, Carole Anne, MS, County Extension Agent Emerita
- Shimel, William Alexander, PhD, State Extension Leader Emeritus
- Shipe, Emerson R., PhD, Professor Emeritus of Agronomy
- Shively, Jessup Maclean, PhD, Professor Emeritus of Biochemistry
- Sias, Frederick Ralph, Jr., PhD, Professor Emeritus of Electrical and Computer Engineering
- Sieverdes, Christopher M., Professor Emeritus of Applied Economics and Statistics
- Sill, Benjamin L., PhD, Professor Emeritus of Civil Engineering
- Sill, Lois P., MLS, Librarian Emeritus
- Silvers, Stuart, PhD, Professor Emeritus of Philosophy
- Simmons, James B., EdD, Professor Emeritus of Graphic Communications
- Simms, John Barber, MA, Professor Emeritus of English
- Sinka, Margit, Ph.D., Professor Emerita of German
- Skaar, Eric C., PhD, Associate Professor Emeritus of Materials Science and Engineering
- Skardon, Beverly Norton, MA, Professor Emeritus of English
- Skelley, George Calvin, Jr., PhD, Professor Emeritus of Animal Science
- Skelton, Billy Ray, PhD, Professor Emeritus of Economics
- Skelton, Bobby Joe, PhD, Vice Provost and Dean Emeritus of Admissions and Registration; Professor Emeritus of Horticulture
- Skelton, Thomas Eugene, PhD, Head and Professor Emeritus of Entomology
- Skipper, Horace D., PhD, Professor Emeritus of Crop and Soil Environmental Science
- Skove, Malcolm John, PhD, Alumni Professor Emeritus of Physics
- Slann, Martin Wayne, PhD, Chair and Professor Emeritus of Political Science
- Sligh, Chevis Raymond, MS, County Extension Agent Emeritus
- Smart, Patricia A., PhD, Professor Emerita of Nursing
- Smathers, Diane G., PhD, Professor Emerita of Family and Youth Development and Director of Emeritus College
- Smathers, Webb M., PhD, Professor Emeritus of Agricultural and Applied Economics
- Smink, Jay, PhD, Professor Emeritus of Leadership, Counselor Education, and Human Organizational Development and Director of the National Dropout Prevention Center
- Smith, Alton Denny, PHD, Associate Professor Emeritus of Biological Sciences
- Smith, Bill Ross, PhD, Professor Emeritus of Entomology, Soils, and Plant Sciences
- Smith, Chester Roland, PhD, Professor Emeritus of Industrial Management
- Smith, Claude, Jr., BS, County Extension Agent Emeritus
- Snelsire, Robert William, PhD, Professor Emeritus of Electrical and Computer Engineering
- Sowell, Talley West, MS, County Extension Agent Emerita
- Spalding, Robert Emmet, Jr., MS, Extension Associate Emeritus
- Sparks, Elisa K., PhD, Associate Professor of English
- Sparks, Peter R., PhD, Professor Emeritus of Civil Engineering
- Spira, Timothy P., PhD, Professor Emeritus of Biological Sciences
- Spitzer, John C., PhD, Professor Emeritus of Animal and Veterinary Sciences
- Spivey, Leslee David, BS, Distinguished County Extension Agent Emerita
- Spragins, John Diggs, PhD, Professor Emeritus of Electrical and Computer Engineering
- Stafford, Georgeanne Hatch, County Extension Agent Emerita
- Stanton, Lynn Arthur, PhD, Professor Emeritus of Agricultural and Applied Economics
- Steadman, Mark Sidney, Jr., PhD, Alumni Distinguished Professor Emeritus of English and Writer in Residence
- Steiner, Pinckney Alston, PhD, Professor Emeritus of Physics
- Stephens, Robert Lorin, MS, County Extension Agent Emeritus
- Stevenson, Dennis E., PhD, Associate Professor Emeritus of School of Computing
- Stevenson, John Lovett, PhD, Assistant Dean Emeritus of Undergraduate Studies; Director Emeritus of Honors Program; Professor Emeritus of Parks, Recreation, and Tourism Management
- Stillwell, Ephraim Posey, Jr., PhD, Professor Emeritus of Physics
- Stockham, James Allen, MFA, Professor Emeritus of Art
- Strange, Sylvia Fortner, BS, County Extension Agent Emerita
- Strickland, Deborah Riley, County Extension Agent Emerita
- Stringer, William C., Ph.D., Associate Professor Emeritus of Agronomy and Soils
- Sturgis, Eugenie Ventre, MS, Professor Emerita of Mathematical Sciences
- Sturkie, Douglas Kinly, PhD, Professor Emeritus of Sociology
- Stutzenberger, Fred John, PhD, Professor Emeritus of Biological Sciences
- Sudduth, Terry Q., MS, Assistant Director of Extension Emeritus
- Suggs, Henry Lewis, PhD, Professor Emeritus of History
- Sullivan, Michael Jack, PhD, Professor Emeritus of Entomology, Soils, and Plant Sciences
- Sullivan, Sophia Elizabeth, MS, Librarian Emerita
- Surak, John G., PhD, Professor Emeritus of Applied Economics and Statistics
- Sutton, Russell Wayne, PhD, Professor Emeritus of Applied Economics and Statistics
- Swaja, Richard, PhD, Professor Emeritus of Bioengineering
- Swanson, David Mitchell, PhD, Professor Emeritus of Management and Economics
- Sweeney, James Napoleon, MA, County Extension Director Emeritus
- Sweeney, John R., PhD, Associate Dean and Professor Emeritus of Forestry and Natural Resources
- Syme, John Hutton, PhD, Professor Emeritus of Forest Resources
- Szumlo, Karyna M., PhD, Professor Emerita of Languages
- Tainter, Franklin Hugh, PhD, Professor Emeritus of Forest Resources
- Talbert, Mark J., MS, County Extension Agent Emeritus
- Tanner, Gloria Ann, EdD, Professor Emerita of Nursing Science
- Taras, Michael Andrew, PhD, Head and Professor Emeritus of Forest Resources
- Taylor, Charlotte Murrow, EdD, Professor Emerita of Counseling and Educational Leadership
- Taylor, Mary Lee, Distinguished County Agent Emerita
- Taylor, Theodore D., Associate Professor Emeritus, Materials Science and Engineering
- Tesolowski, Dennis Gregory, EdD, Professor Emeritus of Technology and Human Resource Development
- Thames, Brenda J., PhD, Associate Dean and Professor Emerita of Family and Youth Development
- Thomas, Frances Petrie, BS, County Extension Agent Emerita
- Thomas, Ronald L., PhD, Professor Emeritus of Food, Nutrition, and Packaging Sciences
- Thomason, Deborah J., PhD, Professor Emerita of Family and Youth Development
- Thompson, C. Stassen, PhD, Director of Land Management and Professor Emeritus of Applied Economics and Statistics
- Thompson, Carl E., PhD, Professor Emeritus of Animal and Veterinary Sciences
- Thompson, G. Richard, PhD, Professor Emeritus of Economics
- Thompson, Regina, MA, Professor Emerita of Nursing
- Thompson, Sharon W., MSN, Associate Professor Emerita of Nursing
- Thomson, William Russell, MS, Distinguished County Extension Agent Emeritus
- Thurston, Ronald J., PhD, Professor Emeritus of Animal and Veterinary Sciences
- Tillinghast, David Charles, PhD, Professor Emeritus of English
- Timms, Janet L., PhD, Associate Professor Emerita of Nursing
- Titus, Sylvia Smith, MA, Professor Emerita of English
- Titus, Terry Charles, PhD, Professor Emeritus of Food Science

- Toler, Joe**, PhD, Professor Emeritus of Applied Economics and Statistics
- Trapnell, Jerry Eugene**, PhD, Dean Emeritus, College of Business and Behavioral Science and Professor Emeritus of Accountancy
- Trent, Buford Earl**, MEd, Professor Emeritus of Parks, Recreation, and Tourism Management
- Turk, Donald Earle**, PhD, Professor Emeritus of Food Science
- Turner, Albert Joseph, Jr.**, PhD, Professor Emeritus of Computer Science
- Turner, Raymond Clyde**, PhD, Alumni Distinguished Professor Emeritus of Physics
- Turnipseed, Samuel G.**, PhD, Professor Emeritus of Entomology, Soils, and Plant Sciences
- Tyler, Thomasina Cooper**, Distinguished County Agent Emerita
- Ulbrich, Carlton Wilbur**, PhD, Professor Emeritus of Physics
- Ulbrich, Holley Hewitt**, PhD, Alumni Professor Emerita of Economics
- Underwood, Richard Allan**, PhD, Professor Emeritus of English
- Van Dijk, Howard J.**, PhD, County Extension Agent Emeritus
- Van Lear, David H.**, PhD, Robert A. Bowen Professor Emeritus of Forestry
- Vaughn, Edward A.**, PhD, Professor Emeritus of Materials Science and Engineering
- Vergano, Peter J.**, PhD, Professor Emeritus of Packaging Science
- Vines, Dwight T.**, PhD, Associate Professor Emeritus of Animal and Veterinary Sciences
- Waddle, Gerald Lee**, PhD, Professor Emeritus of Marketing
- Wagner, Donald Finch**, PhD, Professor Emeritus of Horticulture
- Wagner, John R.**, PhD, Professor Emeritus of Environmental Engineering and Earth Sciences
- Wainscott, Stephen H.**, PhD, Professor Emeritus of Political Science and Director of Calhoun Honors College
- Walker, Gerald Lee**, PhD, Professor Emeritus of Art and Architectural History
- Walker, John Henry**, PhD, Professor Emeritus of Educational Foundations
- Walker, Nancy Hilton**, PhD, Professor Emerita of Entomology, Soils, and Plant Sciences
- Walker, Walter Saxon**, MEd, Professor Emeritus of Poultry Science
- Wallace, Myles Stuart**, PhD, Professor Emeritus of Economics
- Wallenius, Kenneth Ted**, PhD, Professor Emeritus of Mathematical Sciences
- Waller, Robert Alfred**, PhD, Dean Emeritus, College of Liberal Arts; Professor Emeritus of History
- Wang, Samuel M.**, MA, Alumni Distinguished Professor Emeritus of Art
- Wannamaker, Patricia Walker**, PhD, Professor Emerita of German
- Ward, Carol Marie**, PhD, Professor Emerita of English
- Ward, William A.**, PhD, Professor Emeritus of Economics
- Warner, John T.**, PhD, Professor Emeritus of Economics
- Warner, Richard D.**, PhD, Professor Emeritus of Environmental Engineering and Earth Sciences
- Watkins, Betty Palmer**, PhD, Professor Emerita of Vocational Education
- Watson, William Anthony**, MS, County Extension Agent Emeritus
- Watt Jr, Marshall P.**, MS, County Extension Agent Emeritus
- Weatherford, Carol G.**, PhD, Associate Professor Emerita of Teacher Education
- Weatherford, David E.**, PhD, Professor Emeritus of Family Outreach
- Webb, Byron Kenneth**, PhD, Dean and Director Emeritus of Cooperative Extension Service; Professor Emeritus of Agricultural and Biological Engineering
- Webb, Carol Johnson**, Associate Dean of Extension Emerita
- Webster, Henry Wise**, PhD, Professor Emeritus of Animal, Dairy, and Veterinary Science
- Weir, Eldon Lee**, EdD, Professor Emeritus of Graphic Communications
- Weir, Julia K.**, MEd, Professor Emerita of Teacher Education
- Wells, Amos, Jr.**, BS, County Extension Agent Emeritus
- Wells, Mae Edwards**, MEd, County Extension Agent Emerita
- Welter, John Finlay**, MS, Professor Emeritus of Poultry Science
- West, William Elmer**, PhD, Chair and Professor Emeritus of Industrial Education and Graphic Communications
- Westall, James M**, PhD, Professor Emeritus of Computer Science
- Wheeler, Alfred P.**, PhD, Professor Emeritus of Biological Sciences
- Whetstone, Jack M.**, Master's, Associate Professor Emeritus of Forestry and Natural Resources
- White, Charlie R., Jr.**, MS, Associate Professor Emeritus of Parks, Recreation, and Tourism Management
- White, Donald**, BS, County Extension Agent Emeritus
- White, Mervin Forrest**, PhD, Professor Emeritus of Sociology
- White, Richard Kenneth**, PhD, Newman Professor Emeritus of Natural Resources Engineering in Agricultural and Biological Engineering and Environmental Engineering and Science
- White, Sr., Curtis D.**, Ph.D., Professor Emeritus of Biosystems Engineering
- Whitehurst, Clinton Howard, Jr.**, PhD, Professor Emeritus of Management and Economics
- Whitmire, Jerry Morris**, MA, Professor Emeritus of Spanish
- Wiggins, Emily Sutherland**, EdD, Professor Emerita of Home Economics
- Willey, Edward Parker**, PhD, Professor Emeritus of English
- Williams, Frankie K.**, PhD, Associate Professor Emeritus of Leadership, Counselor Education, and Human Organizational Development
- Williams, Gloristine Fowler**, County Extension Agent Emerita
- Williams, John Newton II**, PhD, Professor Emeritus of Animal Science
- Williams, Patricia Miller**, Interim County Extension Director Emerita
- Williams, Thomas M.**, PhD, Professor Emeritus of Forestry and Natural Resources
- Williams, Woodie Prentiss, Jr.**, PhD, Professor Emeritus of Food Science
- Williamson, Robert Elmore**, PhD, Professor Emeritus of Agricultural and Biological Engineering
- Willingham, Russell**, MA, Professor Emeritus of Languages
- Willis, Samuel Marsh**, PhD, Professor Emeritus of Industrial Management
- Wilson, Martha Craft**, County Extension Agent Emerita
- Wilson, Thomas Virgil**, PhD, Alumni Professor Emeritus of Agricultural and Biological Engineering
- Winchell, Donna H.**, PhD, Professor Emerita of English
- Witcher, Wesley**, PhD, Professor Emeritus of Plant Pathology and Physiology
- Witherspoon, Gayland Brooks**, MArch, Associate Dean Emeritus, College of Architecture; Professor Emeritus of Architecture
- Withington, Marian Hull**, MS, Librarian Emerita
- Wixson, Bobby Guinn**, PhD, Dean Emeritus, College of Sciences; Professor Emeritus of Biological Sciences
- Wolak, Francis J.**, PhD, Professor Emeritus of Agricultural and Biological Engineering
- Wood, Gene W.**, Professor Emeritus of Forestry and Natural Resources
- Wood, Wallace Blackwell, Jr.**, Distinguished County Agent Emeritus
- Woodell, Charles Harold**, PhD, Professor Emeritus of English
- Woodruff, James Raymond**, PhD, Professor Emeritus of Agronomy and Soils
- Wynn, Eddie Dowell**, MCRP, Professor Emeritus of Agricultural and Applied Economics
- Wynn, Mable Hill**, MS, Professor Emerita of Parks, Recreation, and Tourism Management
- Xu, Xiao-Bang**, PhD, Professor Emeritus of Electrical and Computer Engineering
- Yandle, Thomas Bruce, Jr.**, PhD, Dean Emeritus, College of Business and Behavioral Science; Alumni Distinguished Professor Emeritus of Economics
- Yang, Tah-Teh**, PhD, Professor Emeritus of Mechanical Engineering
- Yardley, Darrell Gene**, PhD, Professor Emeritus of Zoology
- Yates, William Pierce**, MS, Extension Program Coordinator Emeritus
- Young, Arthur P.**, PhD, Campbell Endowed Chair and Professor Emeritus of English
- Zehr, Eldon Irvin**, PhD, Professor Emeritus of Plant Pathology and Physiology
- Zielinski, Paul Bernard**, PhD, Director Emeritus, Water Resource Research Institute; Professor Emeritus of Civil Engineering
- Zimmerman, James Kenneth**, PhD, Professor Emeritus of Biochemistry

APPENDIX

ENGLISH FLUENCY

Clemson University has established a policy to assure that all instructional activities are conducted by individuals possessing appropriate proficiency in written and oral use of the English language. Instructional activities include lectures, recitation or discussion sessions, and laboratories. The individuals to be certified include full-time and part-time faculty, graduate teachers of record, graduate teaching assistants, and graduate laboratory assistants for whom English is not the first language.

A student who experiences difficulty with an instructor's written or oral English and who wishes to seek relief must do so prior to the seventh meeting of a 50-minute class and prior to the fifth meeting of a 90-minute class in regular semesters. In summer sessions, relief must be sought prior to the third class meeting.

The procedure is summarized as follows:

a. The student must quickly bring the problem to the attention of the instructor's department chair either directly or through a faculty member such as the student's advisor. That department chair will assess the complaint and, if deemed valid, offer an appropriate remedy within two days.

b. A student who is not satisfied with the department chair's decision or the relief suggested, may appeal within two days to a five-member hearing panel comprised of three faculty members and two students appointed by the Dean of Undergraduate Studies.

Students with questions should contact the Associate Dean of Undergraduate Studies, E-103 Martin Hall.

EQUAL OPPORTUNITY/ NON DISCRIMINATION/ AFFIRMATIVE ACTION

Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran's status, genetic information or protected activity (e.g., opposition to prohibited discrimination or participation in any complaint process, etc.) in employment, educational programs and activities, admissions and financial aid.

Clemson University's policy of Non-Discrimination is intended to meet responsibilities under Titles VI and VII of the Civil Rights Act 1964, the Pregnancy Discrimination Act of 1978, Title IX of the Education Amendments of 1972, Sections 503 and 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990, the Age Discrimination in Employment Act of 1967, the Age Discrimination Act of 1975, the Vietnam Veterans Readjustment Assistance Act of 1974, the Genetic Information Non-discrimination Act of 2008, the Violence Against Women Act, and applicable provisions of the South Carolina Human Affairs Law.

Clemson University conducts its programs and activities involving admission, access, treatment, employment, teaching, research, and public service in a nondiscriminatory manner as prescribed by Federal laws and regulations.

In conformance with University policy and pursuant to Executive Order 11246, as amended, Section 503 of the Rehabilitation Act of 1973, and Section 402 of the Vietnam Era Veterans Readjustment Act of 1974, and South Carolina Human Affairs Law, Clemson University is an Affirmative Action/Equal Opportunity Employer.

Inquiries concerning the above may be addressed to the following:

Director, Office for Access and
Equity and Title IX Coordinator
110 Holtzendorff Hall
Clemson University
Clemson, SC 29634

Director, Office for Civil Rights
Department of Education
Washington, DC 20201

U.S. Equal Employment Opportunity Commission
Washington, DC 20507

FAMILY PRIVACY PROTECTION ACT

The South Carolina Family Privacy Protection Act (SC Code 30-2-10 et. seq.) defines personal information as "...information that identifies or describes an individual including, but not limited to, an individual's photograph or digitized image, social security number, date of birth, driver's identification number, name, home address, home telephone number, medical or disability information, education level, financial status, bank account(s) number(s), account or identification number issued by and/or used by any federal or state governmental agency or private financial institution, employment history, height, weight, race, other physical details, signature, biometric identifiers, and any credit records or reports."

Some of the information in documents which students provide to Clemson University may be personal information as defined above. Pursuant to Section 30-2-40 B, students are advised that this information may be subject to public scrutiny or release. They are also advised that personally-identifiable information contained in these educational records falls under the federal Family Educational Rights and Privacy Act of 1974, as amended (FERPA). If students elect to opt out of the release of directory information under FERPA, the University will not release any personal information except as otherwise required or authorized by law.

Visit <http://www.clemson.edu/privacypolicy.html> for additional information.

HARASSMENT

In general, harassment is unwelcome verbal or physical conduct, based upon race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, status as a military veteran, genetic information or protected activity (e.g., opposition to prohibited discrimination or participation in the statutory complaint process), that unreasonably interferes with the person's work or educational performance or creates an intimidating or hostile work or educational environment. Examples may include, but are not limited to, epithets, slurs, jokes or other verbal, graphic or physical conduct.

Title IX of the Educational Amendments of 1972 (amending the Higher Education Act of 1965) is a federal gender equity law that prohibits discrimination based on sex in education programs and activities that receive federal funding. Sexual harassment, which includes sexual violence and other forms of nonconsensual sexual misconduct, is a form of sex discrimination and is prohibited under this law.

The entire text of the University's policy on harassment and additional information on Title IX and sexual harassment can be obtained from the Office of Access and Equity, 110 Holtzendorff, (864) 656-3181 or at www.clemson.edu/access/policies.html.

INFORMATION RESOURCES FOR STUDENTS

Clemson University computing resources are the property of Clemson University, to be used for university-related business. Students have no expectation of privacy when utilizing university computing resources, even if the use is for personal purposes. The university reserves the right to inspect, without notice, the contents of computer files regardless of medium, the contents of electronic mailboxes and computer conferencing systems, systems output such as printouts, and to monitor network communication when

1. It is considered reasonably necessary to maintain or protect the integrity, security or functionality of university or other computer resources or to protect the university from liability;
2. There is reasonable cause to believe that the users have violated this policy or otherwise misused computing resources;
3. An account appears to be engaged in unusual or unusually excessive activity;
4. It is otherwise required or permitted by law.

Any suspected violations of this policy or any other misuse of computer resources by students normally should be referred to the Office of Student Conduct. That office will investigate the allegations and take appropriate disciplinary action. Violations of law related to misuse of computing resources may be referred to the appropriate law enforcement agency.

Notwithstanding the above, Clemson Computing and Information Technology may temporarily suspend, block or restrict access to an account, independent of university disciplinary procedures, when it appears reasonably necessary to do so in order to protect the integrity, security or functionality of

university or other computer resources, to protect the university from liability, or where the emotional or physical well-being of any person is immediately threatened. When CCIT unilaterally takes such action, it will immediately notify the account holder of its actions and the reason for them in writing. The account holder may appeal the action taken by CCIT in writing to the Chief Information Officer.

Access will be restored to the account holder whenever the appropriate investigatory unit of the university determines that the protection of the integrity, security or functionality of university or other computing resources has been restored and the safety and well being of all individuals can reasonably be assured, unless access is to remain suspended as a result of formal disciplinary action imposed through the Office of Student Conduct or as a result of legal action.

Use of University computing resources, including network facilities, account numbers, data storage media, printers, plotters, microcomputer systems, and software for computing activities other than those authorized by the University is strictly prohibited. Unauthorized use of such resources is regarded as a criminal act in the nature of theft, and violators are subject to suspension, expulsion, and civil and criminal prosecution.

Use of university computing resources, including network facilities, account numbers, data storage media, printers, plotters, microcomputer systems, and software for computing activities other than those authorized by the university is strictly prohibited. Unauthorized use of such resources is regarded as a criminal act in the nature of theft and violators are subject to suspension, expulsion, and civil and criminal prosecution.

The following are examples of misuse of computing resources:

1. Unauthorized duplication, distribution or alteration of any licensed software. This includes software licensed by the university and licensed software accessed using the computing networks.
2. Attempting to gain unauthorized access to any computing resource or data, or attempting to disrupt the normal operation of any computing resource or network – at Clemson or anywhere on the Internet,
3. Attempting to use another student's or employee's computer account or data, without their permission.
4. Using the university electronic mail system to attack other computer systems, falsify the identity of the source of electronic mail messages. Sending harassing, obscene or other threatening electronic mail. Attempting to read, delete, copy or modify the electronic mail of others without their authorization. Sending, without official university authorization, "for-profit" messages, chain letters or other unsolicited "junk" mail.
5. Knowingly infecting any computing resource with a software virus.
6. Tampering with the university computer network or building wiring or installing any type of electronic equipment or software that could be used to capture or change information intended for someone else.

7. Participating in a "denial of service" attack on any other computer, whether on or off campus.

8. Using university computing or network resources for personal gain or illegal activities such as theft, fraud, copyright infringement, piracy (e.g., sound or video recording), or distribution of child pornography or obscenities.

PATENTS AND COPYRIGHTS

All students enrolling in Clemson University do so with the full understanding that students working on sponsored projects and/or who use Clemson University resources other than for lecture-based coursework or other course-related assignments are subject to the Clemson University Intellectual Property Policy.

1) In accordance with the University Intellectual Property Policy, student Creators* do not hold rights to intellectual property created developed, or generated:

- i. In the course of rendering compensated services to the University; or
- ii. As part of sponsored research projects; or
- iii. Pursuant to an agreement that requires the University and/or student to assign his or her rights either to the University or to a third party; or
- iv. Using pre-existing or background intellectual property belonging to the University or a third party with whom the University has a contract under which such background intellectual property rights are already allocated.

v. Notes:

1. Student retains a non-exclusive, royalty-free, perpetual, irrevocable license to use, reproduce, and publicly distribute, for educational and/or research purposes, copies of intellectual property created by student.
2. If intellectual property is developed or generated as a group class project, joint ownership by the collaborators will be assumed unless a prior written agreement exists among the collaborators.

*A Creator is defined as an author of, inventor of, or person who discovers, develops, or generates any type of intellectual property. Inventorship and authorship shall be determined in accordance with patent law and copyright law, respectively.

Section 5.c of the University Intellectual Property Policy, November 23, 2009

2) All Creators have a duty to promptly disclose intellectual property authored, invented, created, discovered, developed, or generated by Creator(s) to the Clemson University Intellectual Property Committee (IPC). See *Appendix III, University Intellectual Property Policy, November 23, 2009*.

3) Except as set forth in other related University policies, this applies to all types of intellectual property, including, but not limited to, any invention, discovery, creation, know-how, trade secret, technology, scientific or technological development, mask work, trademark, research data, work of authorship,

and computer software regardless of whether subject to protection under patent, trademark, copyright, or other laws.

The University Intellectual Property policy is available online at www.clemson.edu/research/technology/policies. Questions regarding this policy should be directed to the Office of Technology Transfer at (864) 656-4237.

INDEX

A

AAH, 132
 Abbreviations, Course, 132
 Abstract Mathematics Emphasis Area, 109
 Academic Advising, 29 (see also Advising Policy)
 Academic Affairs, 8
 Academic and Professional Development Requirement (General Education), 39
 Academic Calendar, 5
 Academic Dishonesty (see Academic Integrity)
 Academic Eligibility Policy, 28
 Academic Forgiveness Policy, 29
 Academic Grievance Policy, 33
 Academic Honors, 31
 Academic Integrity, Undergraduate, 32
 Academic Misconduct for Former Students, 35
 Academic Probation (see Academic Eligibility Policy)
 Academic Records, 32
 Academic Regulations, 27
 Academic Renewal, 32
 Academic Success Center, 25
 Accounting, 40, 83, 133
 Accounts, Past Due, 18
 Accreditation, 10
 ACCT, 133
 ACT (see Entrance Examinations)
 Actuarial Science/Financial Mathematics Emphasis Area, 109
 Admission, 14, 82, 94, 123
 Admission Deposit, 16
 Admissions Exceptions, 16
 Administration, 8
 Adult/Extension Education, 40
 Advanced Placement, 15, 16, 27
 Advancement in Architecture, 64
 Advancement in Graphic Communications, 86
 Advising Policy, 10
 Advisors (see Academic Advising; Advising Policy)
 Aerospace Studies, 40, 82, 142 (see also Reserve Officers Training Corps)
 Affirmative Action, 290
 AFROTC, 82 (see also Reserve Officers Training Corps)
 AGED, 133
 AGM, 135
 AGRB, 136
 Agribusiness, 44, 136
 Agricultural Biotechnology Concentration, 59
 Agricultural Business Management, 40
 Agricultural Education, 44, 124, 133
 Agricultural Mechanization, 135
 Agricultural Mechanization and Business, 40, 45
 Agriculture, Forestry and Life Sciences, College of, 8, 44
 Agronomy Concentration, 59
 AL, 132
 Alumni Association, 13
 American Politics Concentration, 89
 American Sign Language, 143
 American Sign Language Emphasis Area, 71
 American Sign Language Studies, 40
 Animal Agribusiness Concentration, 46
 Animal and Veterinary Sciences, 40, 46, 145
 ANTH, 138
 Anthropology, 40, 83, 84, 138
 AP (see Advanced Placement)
 Appeals, Admission, 16
 Appeals, Grade, 30
 Application, Admission, 14

Application Deadlines, 14
 Applied and Computational Mathematics Emphasis Area, 109
 Applied International Economics Concentration, 70
 ARAB, 139
 Arabic, 139
 ARCH, 139
 Architectural Registration/Licensure, 65
 Architecture, 40, 64, 139
 Architecture, Arts and Humanities, College of, 8, 64, 157
 Architecture Charleston Program, 64
 Architecture Overseas Program, 64
 Army ROTC, 82 (see also Reserve Officers Training Corps)
 Art, 40, 141
 Art and Architectural History, 132
 Article V, 20
 Arts and Humanities Requirement (General Education), 38
 Arts, School of the, 64
 AS, 142
 ASL, 143
 ASTR, 144
 Astronomy, 144
 Athletic Leadership, 40, 123, 137
 Attendance Policy, 29
 AUD, 144
 Audio Technology, 144
 Audio Technology Concentration, 75
 Auditing, 30
 AVS, 145

B

BCHM, 147
 BE, 148
 Behavioral and Social Science Programs, 82
 Biochemistry, 40, 48, 147
 BIOE, 149
 Bioelectrical Concentration, 95
 Bioengineering, 95, 149
 BIOL, 151
 Biological Sciences, 40, 48, 49
 Biological Sciences (Teaching Area), 126
 Biology, 151
 Biology Concentration, 109
 Biomaterials Concentration, 95
 Biomedicine Concentration, 57
 Biomolecular Engineering, 156
 Biomolecular Engineering Concentration, 98
 Biophysics Concentration, 111
 Bioprocess Engineering Emphasis Area, 97
 Biosystems Engineering, 96, 148
 Biosystems Technology, 156
 BMOL, 156
 Board of Trustees, 8
 Board of Visitors, 8
 British and Irish Studies, 40
 BT, 156
 BUS, 156
 Business, 156
 Business Administration, 40
 Business and Behavioral Science, College of, 8, 82
 Business and Professional Programs, 82

C

CAAH, 157
 Calendar (see Academic Calendar)
 Calhoun Honors College, 11
 Campus, 10
 Campus Visits and Tours, 13

Cardiovascular Imaging Leadership Concentration 114
 Cardiovascular Technology, 169
 Career and Technology Education, 169
 CE, 157
 Center for Career and Professional Development, 12, 26
 CES, 159
 CH, 159
 Change of Major, 32
 CHE, 161
 Chemical Engineering, 97, 161
 Chemistry, 40, 104, 159
 CHIN, 162
 Chinese, 162
 Chinese Emphasis Area, 72
 City and Regional Planning, 168
 Civil Engineering, 98, 157
 Class Attendance, 29 (see also First Day Class Attendance)
 Classification of Students, 32
 Classwork, 29
 Clemson Abroad Programs, 12
 Clemson University (CU), 169
 Clemson University Experiment Station, 12
 Clemson University Foundation, 12
 CLEP (see College-Level Examination Program)
 Cluster Minor, 40
 College Board Advanced Placement, 15, 16, 27
 College-Level Examination Program, 16
 College of Agriculture, Forestry and Life Sciences, 8, 44
 College of Architecture, Arts and Humanities (CAAH), 8, 64, 157
 College of Business and Behavioral Science, 8, 82
 College of Engineering and Science (CES), 8, 94, 159
 College of Health, Education and Human Development (HEHD), 8, 114, 202
 Collegiate Deans, 8
 Combined Bachelor's/Master's Plan, 30, 51, 58, 62, 85, 87, 95, 96, 97, 105, 108
 COMM, 163
 Communication Requirement (General Education), 38
 Communication Studies, 40, 65, 163
 Communications Emphasis Area, 45
 Community Recreation, Sport and Camp Management Concentration, 117
 Community Studies Emphasis Area, 91
 Computer Engineering, 99
 Computer Information Systems, 105
 Computer Science, 40, 105, 106, 166
 Computer Science Emphasis Area, 109
 Computing Resources, 10
 Concentrations
 Agricultural Biotechnology, 59
 Agronomy, 59
 American Politics, 89
 Animal Agribusiness, 46
 Applied International Economics, 70
 Audio Technology, 75
 Bioelectrical, 95
 Biology, 109
 Biomaterials, 95
 Biomedicine, 57
 Biomolecular Engineering, 98
 Biophysics, 111
 Cardiovascular Imaging Leadership, 114
 Community Recreation, Sport and Camp Management, 117
 Conservation Biology, 52

- Environmental Science, 107
 Equine Business, 47
 Food Science and Technology, 53
 Global Politics, 89
 Health Promotion and Education, 114
 Health Services Administration, 115
 Hydrogeology, 108
 Inorganic Materials, 102
 International Trade, 70
 Music, 76
 Natural Resource and Economic Policy, 52
 Natural Resources Management, 53
 Nutrition and Dietetics, 54
 Parks and Conservation Area Management, 118
 Political Economy, 89
 Polymeric Materials, 102
 Preprofessional Health Studies, 115
 Preveterinary and Science, 47
 Professional Golf Management, 118
 Public Administration, 89
 Public Policy, 89
 Recreational Therapy, 119
 Soil and Water Science, 60
 Theatre, 76
 Tourism, 71
 Travel and Tourism, 119
 Conservation Biology Concentration, 52
 Construction Science and Management, 66, 168
 Continuing Enrollment Policy (see Academic Eligibility Policy)
 Cooperative Education Program, 11
 Copyrights, 291
 Counseling and Psychological Services, 25
 Course Abbreviations, 132
 Course Prerequisites, 29
 Course Substitutions, 29
 Courses of Instruction, 132
 CPSC, 166
 Credit by Examination, 27
 Credit Limitation, 31
 Credit Load, 27
 Credit System, 27
 Criminal Justice Emphasis Area, 91
 Criminal Records Check, 123
 Critical Thinking, 38
 Crop and Soil Environmental Science, 40
 Cross-Cultural Awareness, 38
 Cross-Cultural Awareness Requirement (General Education), 39
 Cross-Referenced Courses, 132
 CRP, 168
 CSM, 168
 CTE, 169
 CU, 169
 CVT, 169
- D**
 DANC, 170
 Dance, 170
 Dead Days, 30
 Deans, 8
 Dean's List, 31
 Design and Building, School of, 64
 Design Studies, 170
 Digital Production Arts, 40, 170
 Dining, 23
 Director of Athletics, 8
 Disability Services, 26
 Disclosure of Education Records in Health and Safety Emergencies, 3
 Distributed Competencies Requirement (General Education), 39
- Double Major, 31, 49, 67, 112, 126
 DPA, 170
 Dropping Classwork, 28
 DSGN, 170
 Dual Degree Program, 85
 Dual Enrollment, 15
- E**
 Early Childhood Education, 124, 177
 EAS, 170
 East Asian Studies, 41, 170
 ECE, 171
 Ecological Engineering Emphasis Area, 97
 ECON, 174
 Economics, 41, 84, 85, 174
 ED, 176
 EDC, 176
 EDEC, 177
 EDEL, 177
 EDF, 178
 EDLT, 179
 EDSC, 179
 EDSP, 181
 Education, 41, 176
 Education Minors, 123
 Educational Counseling, 176
 Educational Foundations, 178
 EES, 181
 ELE, 183
 Electives (Engineering), 94
 Electrical and Computer Engineering, 171
 Electrical Engineering, 100
 Elementary Education, 124, 177
 EM, 183
 Emphasis Areas
 Abstract Mathematics, 109
 Actuarial Science/Financial Mathematics, 109
 American Sign Language, 71
 Applied and Computational Mathematics, 109
 Bioprocess Engineering, 97
 Chinese, 72
 Communications, 45
 Community Studies, 91
 Computer Science, 109
 Criminal Justice, 91
 Ecological Engineering, 97
 Entomology, 50
 French, 72
 General Sociology, 91
 German, 72
 Italian, 73
 Interdisciplinary, 111
 Japanese, 73
 Land Surveying, 55
 Law, Liberty, and Justice, 75
 Leadership, 45
 Literacy, Culture and Diversity, 124
 Literature, 66
 Mathematics and Science, 125
 Operations Research/Management Science, 109
 Prepharmacy, 50
 Prerehabilitation Sciences, 49
 Social Services, 91
 Spanish, 73
 Statistics, 109
 Teaching, 45
 Toxicology, 51
 Writing and Publication Studies, 66
 Engineering, 186
 Engineering and Science, College of, 8, 94, 159
 Engineering Mechanics, 183
- Engineering Programs, 94
 ENGL, 183
 English, 41, 66, 183
 English Fluency, 290
 English (Teaching Area), 128
 ENGR, 186
 ENR, 188
 Enrollment, 30
 Enrollment in Graduate Courses, 30 (see also Combined Bachelor's/Master's Plan)
 Enrollment in Professional Courses, 123
 Enrollment Limits (see Credit Load)
 ENSP, 188
 ENT, 189
 Entomology, 41, 189
 Entomology Emphasis Area, 50
 Entrance Examinations, 15
 Entrance Requirements, 64, 116 (see also Admission)
 Entrepreneurship, 41
 Environmental and Natural Resources, 51, 188
 Environmental Engineering, 100
 Environmental Engineering and Science, 181
 Environmental Science and Policy, 41, 188
 Environmental Science Concentration, 107
 Environmental Toxicology, 190
 Equal Opportunity, Affirmative Action, 290
 Equine Industry, 41
 Equine Business Concentration, 47
 Ethical Judgment, 38
 ETOX, 190
 Eugene T. Moore School of Education, 8, 123
 Examinations (see Final Examinations)
 Executive Leadership and Entrepreneurship, 183
 Experiment Station, Clemson University, 12
 Experimental Statistics, 257
 External Education Experiences, 27
- F**
 Faculty, 263
 Faculty Emeriti, 284
 Family Educational Rights and Privacy Act, 2
 Family Privacy Protection Act, 290
 FDSC, 190
 Fees (see Tuition and Fees)
 FERPA (see Family Educational Rights and Privacy Act)
 Film Studies, 41
 FIN, 191
 Final Examinations, 28
 Finance, 191
 Financial Aid, 19, 23
 Financial Information, 18
 Financial Management, 41, 85
 Fluency, English, 290
 Food Science, 41, 53, 190
 Food Science and Technology Concentration, 53
 FOR, 193
 Foreign Language Placement Test, 16
 Forest Products, 41
 Forest Resource Management, 41, 54
 Forestry, 193
 Forestry and Natural Resources, 192
 Former Students, 17
 Foundation, Clemson University, 12
 FNR, 192
 FR, 194
 French, 72, 194 (see also Modern Languages)
 French Emphasis Area, 72
 Freshmen, 14
 Full-Time Enrollment, 27
 Full-Time Fees, 18

G

GC, 196
 GED, 16
 GEN, 197
 Gender, Sexuality and Women's Studies, 41
 General Counsel, 8
 General Education Competencies, 38
 General Education Development (see GED)
 General Education Requirements, 38, 94
 General Engineering Program, 94
 General Information, 9
 General Sociology Emphasis Area, 91
 Genetics, 41, 55, 197
 GEOG, 198
 Geography, 41, 198
 GEOL, 198
 Geology, 41, 107, 198
 GER, 201
 German, 72, 201 (see also Modern Languages)
 German Emphasis Area, 72
 Global Politics, 41
 Global Politics Concentration, 89
 Governor's School for Science and Mathematics, 15
 Grade-Point Average, 28
 Grade Protests, 29
 Grade Reports, 28
 Grading System, 27 (see also Grade-Point Average)
 Graduate Courses, Enrollment in, 31 (see also
 Combined Bachelor's/Master's Plan)
 Graduate Degrees, 32
 Graduate Study, 123
 Graduation Requirements, 31, 95
 Graphic Communications, 86, 196
 Great Works, 41, 202
 Grievances and Appeals (see Academic
 Grievance Board)
 GW, 202

H

Harassment, 290
 HCG, 202
 Health, 206
 Health Care Genetics, 202
 Health, Education, and Human Development, 202
 Health, Education, and Human Development,
 College of, 8, 114
 Health Fee, 25
 Health Insurance, 25
 Health Promotion and Education Concentration,
 114
 Health Science, 114
 Health Services Administration Concentration, 115
 Healthy Campus, 25
 HEHD, 202
 HIST, 202
 History, 41, 67, 202
 History of the University, 9
 History (Teaching Area), 129
 HLTH, 206
 HON, 207
 Honor Graduates, 31
 Honor Lists, 31
 Honor Organizations, 12
 Honors and Awards, 31
 Honors Courses, 207
 Honors Program (see Calhoun Honors College)
 HORT, 208
 Horticulture, 41, 56, 208
 Housing, 16, 19, 25
 Housing, Single Student, 25

HUM, 209

Human Resource Management, 42
 Humanities, 209
 Humanities, School of, 64
 Hydrogeology Concentration, 108

I

IB (see International Baccalaureate)
 IE, 210
 Illegal Immigration Reform Act Process, 17
 Immunizations, 25
 In-State Residence (see Resident Tuition and Fees)
 Incomplete Work, 27, 31
 Industrial Engineering, 101, 210
 Information Resources for Students, 290
 Inorganic Materials Concentration, 102
 Integrated Pest Management, 211
 Interdisciplinary Emphasis Area, 111
 International Baccalaureate Credit Policy, 15
 International Engineering and Science, 42
 International Programs, 94 (see also Study Abroad)
 International Studies, 211
 International Trade Concentration, 70
 International Undergraduates, 17
 Internship Programs, 11
 IPM, 211
 IS, 211
 ITAL, 211
 Italian, 211
 Italian Emphasis Area, 73

J

Japanese, 212 (see also Modern Languages)
 Japanese Emphasis Area, 73
 JAPN, 212
 JUST, 213
 Justice Studies, 213

L

Land Surveying Emphasis Area, 55
 Landscape Architecture, 68, 213
 LANG, 213
 Language, 213
 Language and International Health, 68, 116, 216
 Language and International Trade, 69, 216
 Laptop Program, 11
 LARC, 213
 Latin, 215
 LATN, 215
 LAW, 215
 Law, Liberty, and Justice Emphasis Area, 75
 Leadership Emphasis Area, 45
 Learning Experiences, 27
 Legal Studies, 42
 Leisure Skills, 216
 LIB, 215
 Libraries, 10
 Library, 215
 LIH, 216
 LIT, 216
 Literacy, 179
 Literacy, Culture and Diversity Emphasis Area, 124
 Literature Emphasis Area, 66
 Loans (see Financial Aid)
 LS, 216

M

Management, 42, 87, 223
 Management Information Systems, 42
 Marketing, 87, 227
 Materials Science and Engineering, 101, 228

MATH, 218

Mathematical Sciences, 42, 108, 110, 218
 Mathematical, Scientific, and Technological
 Literacy Requirement (General Education), 38
 Mathematics and Science Emphasis Area, 125
 Mathematics Placement Test, 15
 Mathematics (Teaching Area), 129
 Mathematics Teaching, 125
 ME, 221
 Meal Plans (see Dining)
 Mechanical Engineering, 103, 221
 Medical Services, 25
 MGT, 223
 MICR, 225
 Microbiology, 42, 56, 225
 Mid-Term Evaluation, 28
 Military Leadership, 42, 83, 228 (see also Reserve
 Officers Training Corps)
 Minors, 40, 63, 81, 84, 93, 94, 113, 122, 131
 Mission Statement, General Education, 38
 Mission Statement, University, 9
 MKT, 227
 ML, 228
 Modern Languages, 42, 71
 MSE, 228
 MUSC, 230
 Music, 42, 230
 Music Concentration, 76

N

Natural Resource Economics, 42
 Natural Resource and Economic Policy
 Concentration, 52
 Natural Resources Management Concentration, 53
 Nondegree Student (see Special Student)
 Non-discrimination, 290
 Nonprofit Leadership, 42, 232
 NPL, 232
 Nuclear Engineering and Radiological Sciences, 42
 NURS, 233
 Nursing, 116, 233
 NUTR, 235
 Nutrition, 235
 Nutrition and Dietetics Concentration, 54

O

Operations Research/Management Science
 Emphasis Area, 109
 Orientation Programs, 17

P

PA, 235
 Packaging Science, 42, 58, 241
 Pan African Studies, 42, 74, 236
 Park and Protected Area Management, 42
 Parks and Conservation Area Management
 Concentration, 118
 Parks, Recreation and Tourism Management, 117,
 246
 Part-Time Enrollment (see Part-Time Fees)
 Part-Time Fees, 18
 PAS, 236
 Pass/No Pass Option, 28
 Past Due Accounts, 18
 Patents and Copyrights, 291
 Payment by Check, 18
 PCPC, 236
 Pearce Center for Professional Communication,
 236
 Performing Arts, 235
 PES, 236

- PHIL, 238
 Philosophy, 42, 75, 238
 PHSC, 239
 PHYS, 240
 Physical Science, 239
 Physical Sciences (Teaching Area), 127
 Physics, 42, 110, 112, 240
 PKSC, 241
 Placement Tests, 15
 Plant and Environmental Sciences, 58, 236
 Plant Pathology, 42, 243
 PLPA, 243
 Political Economy Concentration, 89
 Political Science, 42, 88, 89, 243
 Polymeric Materials Concentration, 102
 PORT, 243
 Portuguese, 243
 POSC, 243
 Posthumous Degrees, 31
 Preallied Health (see Prerehabilitation Sciences)
 Pre-Business Program, 82
 Precision Agriculture, 42
 Premedicine (see Preprofessional Health Studies)
 Preoccupational Therapy (see Prerehabilitation Sciences)
 Prepharmacy, 60
 Prepharmacy Emphasis Area, 50
 Prephysical Therapy (see Prerehabilitation Sciences)
 Prephysician Assistant Program (see Prerehabilitation Sciences)
 Preprofessional Health Studies, 60
 Preprofessional Health Studies Concentration, 115
 Preprofessional Studies, 31
 Prerehabilitation Sciences, 60
 Prerehabilitation Sciences Emphasis Area, 49
 Prerequisites, 29, 40
 President, University, 8
 President's List, 31
 Preveterinary and Science Concentration, 47
 Preveterinary Medicine, 61
 Probation, Academic (see Academic Eligibility Policy)
 Production Studies in Performing Arts, 75
 Professional Golf Management Concentration, 118
 PRTM, 246
 PSYC, 251
 Psychology, 42, 90, 251
 Public Administration Concentration, 89
 Public Policy, 42
 Public Policy Concentration, 89
 Purpose of Catalog, 9
- R**
 Readmission of Former Undergraduates, 17
 Recreational Therapy, 43, 119
 Recreational Therapy Concentration, 119
 Redfern Health Center, 25
 Refunds of Financial Aid, 19
 Refund of Fees, 18
 Registered Nurse BS Completion Program, 117
 Registration Requirements (Engineering), 94
 REL, 252
 Religion, 43, 252
 Religious Studies, 77
 Repeating Courses, 29 (see also Academic Forgiveness Policy)
 Reserve Officers Training Corps, 12 (see also Aerospace Studies; Military Leadership; ROTC)
 Residence Requirement, Graduation, 31
 Residence Halls (see Housing)
- Residence Status (see Resident Tuition and Fees)
 Resident Classification (see Resident Tuition and Fees)
 Resident Tuition and Fees, 19
 Returned Checks, EFTs, and Credit Card Payments, 18
 Revocation of Academic Degrees, 35
 ROTC, 82 (see also Reserve Officers Training Corps)
 RS, 253
 Rural Sociology, 253
 RUSS, 253
 Russian, 253
 Russian Area Studies, 43
- S**
 SAT (see Entrance Examinations)
 Scholarships (see Financial Aid)
 Scholastic Aptitude Test (see Entrance Examinations)
 School of Design and Building, 64
 School of Education (Eugene T. Moore), 8, 123
 School of Humanities, 64
 School of the Arts, 64
 Science and Technology in Society, 43, 258
 Science and Technology in Society Requirement (General Education), 39
 Science Programs, 104
 Science Teaching, 126
 Screenwriting, 43
 Second Baccalaureate Degree, 31
 Secondary Education, 128, 179
 Senior Citizens, Educational Benefits, 24
 Single Student Housing, 25
 SOC, 254
 Social Sciences Requirement (General Education), 39
 Social Services Emphasis Area, 91
 Social Studies (Teaching Area), 129
 Sociology, 43, 91, 92, 254
 Soil and Water Science Concentration, 60
 South Carolina Governor's School for Science and Mathematics, 15
 South Carolina Residence (see Resident Tuition and Fees)
 SPAN, 256
 Spanish, 256 (see also Modern Languages)
 Spanish-American Area Studies, 43
 Spanish Emphasis Area, 73
 Special Education, 130, 181
 Special Student Status, 17
 Sports Communication, 77
 STAT, 257
 Statistics Emphasis Area, 109
 STS, 258
 Student Affairs, 8
 Student Records (see Academic Records)
 Student Responsibility, 9
 Student Services, 25
 Study Abroad Programs, 12
 Sustainability, 43
- T**
 Teacher Education Programs, 123
 Teaching Areas
 Biological Sciences, 126
 Chemistry, 127
 English, 128
 Mathematics, 129
 Physical Sciences, 127
 Physics, 128
 Social Studies
 History, 129
- Teaching Emphasis Area, 45
 THEA, 258
 Theatre, 43, 258
 Theatre Concentration, 76
 TigerStripe Account, 23
 Tourism Concentration, 71
 Tours (see Campus Visits and Tours)
 Toxicology Emphasis Area, 51
 Transcripts, 32
 Transfer Credit, 14, 27
 Transfer Students, 14
 Travel and Tourism, 43
 Travel and Tourism Concentration, 119
 Trustees Emeriti, 8
 Trustees, University Board of, 8
 Tuition and Fees, 18, 19
 Admission Deposit, 16
 Application (see Application, Admission)
 Full-time, 18
 Part-time, 18
 Payment by Check, 18
 Refund of, 18
 Returned Checks, EFTs, and Credit Card Payments, 18
 Turfgrass, 43, 61
- U**
 Université Catholique de Louvain, Dual Degree Program with, 85
 University Description, 9
 University Governance and Administration, 8
 University Professional Internship and Co-op (UPIC) Program, 12
 UPIC, 12
 Urban Forestry, 43
- V**
 Veterans, Educational Benefits, 24
 Vice Presidents, 8
 Vision Statement, 9
 Visitors Center (see Campus Visits and Tours)
 Visual Arts, 78
- W**
 WCIN, 260
 WFB, 260
 Wildlife and Fisheries Biology, 43, 62, 260
 Withdrawal from Courses, 28 (see also Dropping Classwork)
 Withdrawal from the University, 32
 Women's Leadership, 43, 78
 Women's Studies, 261
 World Cinema, 79, 260
 Writing, 43
 Writing and Publication Studies Emphasis Area, 66
 WS, 261
- Y**
 YDP, 262
 Youth Development Program, 120, 262