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. Prq: 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. Prq: EDSP 3720 and EDSP 3740; and admission to professional level. Prq or concurrent enrollment: EDSP 3750. Coreq: EDSP 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. Prq: 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 Laboratory 0 (1) Non-credit laboratory to accompany EDSP 3750. Coreq: EDSP 3750.

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. Prq: 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. Prq: 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. Prq: 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. Prq: 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. Prq: EDSP 4910; and admission to the professional level. Coreq: EDSP 4900 and EDSP 4920 and EDSP 4930 and EDSP 4940 and EDSP 4960 and EDSP 4970.

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

ENVIRONMENTAL ENGINEERING AND SCIENCE


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 profession and application of engineering fundamentals to environmental systems. Prq: CH 1010 and ENGR 1060 and MATH 1080, each with a grade of C or better. Prq 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. Prq: 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 3000 Honors Seminar: Introduction to Research in Environmental Engineering 1 (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 under-graduate 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 physicochemical 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 physicochemical 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 13 (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 2104 or CH 2210; and one of MIRC 3050 or MIRC 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 4510* Ionizing Radiation Detection and Measurement Laboratory 0 (3) Non-credit laboratory to accompany EES 4110. Coreq: EES 4110.

EES 4511* Ionizing Radiation Detection and Measurement Laboratory 0 (3) Non-credit laboratory to accompany EES 4110. Coreq: EES 4110.

EES 4520 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 4530 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 4570 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 2104 or CH 2210; and one of MIRC 3050 or MIRC 4130.

EES 4590 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 4600 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 4650* 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 2104 or CH 2210.

EES 4800 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 4950 Honors Thesis in Environmental Entrepreneurship
J.E. Hopkins

ELE (ECON) 3210 Economics of Innovation 3 (3)
ELE (MGT) 3150 New Venture Creation 3 (3)
ELE (PSYC, SOC) 3560 Social Science of Entrepreneurship 3 (3)

2015-2016 Undergraduate Announcements
Courses of Instruction

EXECUTIVE LEADERSHIP AND ENTREPRENEURSHIP
Associate Professors: P.T. Gianiodis, W.H. Stewart; Assistant Professors: A.E. Ingram, J.W. Ridge; Lecturers: J.E. Hopkins

ELE 3010 Introduction to Entrepreneurship 3 (3)
This is 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. Prereg: MGT 2010.

ELE (MKT) 3140 New Venture Creation 3 (3)
First in a two-part series that continues with MGT (ELE) 3150 assessing entrepreneurial opportunities. Focuses on creativity, idea generation, marketing 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. Prereg: 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, startup capital, operations and sourcing issues, leadership, team building, and management of rapid growth. May also be offered as MGT 3150. Prereg: 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. Prereg: 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. Prereg: SOC 2010 or SOC 2020 or SOC 2350 or PSYC 2010 or PSYC 1010 or PSOC 1020 or PSOC 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. Prereg: 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. Prereg: 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. Prereg: AGM 2190 or AGM 3190 or AGRB 3020 or AGRB 3190 or MGT 2010.

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.

ENGL 1030 Accelerated Composition Laboratory 0 (0) 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 (0) 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. Prereg: ENGL 2030.

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. Prereg: 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. Prereg: 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. Prereg: ENGL 1030.

ENGL 2141 American 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. Prereg: ENGL 1030.

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