

# ENVIRONMENTAL SCIENCES (ES)

## Environmental Sciences (ES) Courses

### ES 5011. Graduate Studies in Environmental Science. (1-0) 1 Credit Hour.

This course offers an orientation to graduate study, introducing students to the professional standards and practices of our discipline. The course also offers a survey of environmental science. Development of a tentative program of studies and other relevant requirements will be discussed.

This course has Differential Tuition. Course Fee: GS01 \$30.

### ES 5013. Survey Topics in Environmental Science. (3-0) 3 Credit Hours.

Prerequisite: Graduate standing. Analysis of the basic concepts and new scientific developments in environmental science. Case studies will cover a range of relevant topics to promote a thorough understanding of the emergent issues in environmental science. Emphasis will be placed on developing both written and verbal scientific presentation skills.

(Formerly EES 5013. Same as BIO 5013. Credit can be earned for only one of the following: BIO 5013, EES 5013, or ES 5013.) This course has Differential Tuition. Course Fee: GS01 \$90.

### ES 5023. Environmental Statistics. (3-0) 3 Credit Hours.

Prerequisite: ES 1314 and MAT 1133 or their equivalents, or consent of instructor. Emphasis on methods and applications of statistics for environmental science. Measure of location, variability, and association. Interpretation of categorical data, hypothesis testing, and use of statistical software programs and applications. (Formerly EES 5023.

Same as GEO 5023, BIO 5853, and CE 5043. Credit can be earned for only one of the following: BIO 5853, EES 5023, ES 5023, GEO 5023, or CE 5043.) This course has Differential Tuition. Course Fee: GS01 \$90.

### ES 5043. Global Change. (3-0) 3 Credit Hours.

Prerequisite: Graduate standing in the program or consent of instructor. Changes in the global distribution of plants and animals and the causes of the changes will be examined. Factors that are apparently coupled to changes in the atmosphere and environmental temperature will be examined. (Formerly EES 5043 and CE 6113. Same as BIO 5043 and CE 6383. Credit can be earned for only one of the following: BIO 5043, CE 6113, CE 6383, EES 5043, or ES 5043.) This course has Differential Tuition. Course Fee: GS01 \$90.

### ES 5063. Environmental Microbiology. (3-0) 3 Credit Hours.

Prerequisite: BIO 3713 or consent of instructor. To provide a basic understanding of environmental microbiology primarily from two aspects: microbial interactions with chemical pollutants in the environment and the fate of microbial pathogens in the environment. Topics covered include microbial environments, detection of bacteria and their activities in the environment, microbial biogeochemistry, bioremediation, and water quality. (Formerly EES 5063, CE 5203, and CE 5673. Same as BIO 5063. Credit can be earned for only one of the following: BIO 5063, CE 5203, CE 5673, EES 5063, or ES 5063). This course has Differential Tuition. Course Fee: GS01 \$90.

### ES 5083. Mammalogy. (3-0) 3 Credit Hours.

Prerequisite: Graduate Standing. An advanced course covering various aspects of the biology of mammals, including anatomy, physiology, systematics, evolution, behavior, ecology, and biogeography. Field trips may be required. (Same as BIO 5083. Credit cannot be earned for both BIO 5083 and ES 5083.) This course has Differential Tuition. Course Fee: GS01 \$90; LRS1 \$46.20; STSI \$21.60.

### ES 5093. Herpetology. (3-0) 3 Credit Hours.

Prerequisite: Graduate Standing. An advanced course covering various aspects of the biology of herpetofaunal, including anatomy, physiology, systematics, evolution, behavior, ecology, and biogeography. Field trips may be required. (Same as BIO 5093. Credit cannot be earned for both BIO 5093 and ES 5093.) This course has Differential Tuition. Course Fee: GS01 \$90; LRS1 \$46.20; STSI \$21.60.

### ES 5103. Applied Ecology. (3-0) 3 Credit Hours.

The impact of humanity's activities on the environment: their effect on water, land, animal, and human resources. An evaluation of present and future strategies to preserve a healthy environment. (Formerly EES 5103. Same as BIO 5223. Credit can only be earned for one of the following: BIO 5223, EES 5103, and ES 5103.) This course has Differential Tuition. Course Fee: GS01 \$90; LRS1 \$46.20; STSI \$21.60.

### ES 5113. River Ecosystems. (3-0) 3 Credit Hours.

Prerequisite: Graduate standing in biology or environmental science, or consent of instructor. This course examines the physical, chemical, and biological factors that determine biodiversity and the structure and function of aquatic and riparian ecosystems. Key ecological and hydrogeomorphology concepts and their application to environmental concerns are covered. Field trip required. (Same as BIO 5103. Credit cannot be earned for both BIO 5103 and ES 5113. Formerly titled "Freshwater Ecology.") This course has Differential Tuition. Course Fee: GS01 \$90.

### ES 5133. Fundamentals of Environmental Law. (3-0) 3 Credit Hours.

Prerequisite: Graduate Standing. This course exposes students to basic legal theories relevant to contemporary environmental practice, and provides an introduction to administrative law as well as six federal environmental statutes: the Clean Air Act, Clean Water Act, National Environmental Policy Act, Endangered Species Act, Resource Conservation and Recovery Act, and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This course has Differential Tuition. Course Fee: GS01 \$90.

### ES 5143. Technical Writing for Environmental Scientists. (3-0) 3 Credit Hours.

Prerequisite: Graduate standing. A course designed to give graduate students the skills necessary to write a manuscript for peer review and to prepare other professional materials for presentation or publication. Topics covered in this course include: searching the scientific literature; scientific writing style; writing graduate level papers, proposals, projects, and thesis components; preparing scientific presentations; presentation of data; using visual aids; and using word processing, spreadsheet, and presentation software. This course has Differential Tuition. Course Fee: GS01 \$90.

### ES 5153. Urban Environmental Planning and Sustainability. (3-0) 3 Credit Hours.

This course examines how the concept of sustainable development applies to buildings, cities and urban regions and gives students insight into a variety of contemporary urban planning and green building issues through the sustainability lens. Ways to coordinate goals of environmental, economic, and social equity at different scales of planning are addressed, including the region, the city, the neighborhood, the site, and buildings. This course has Differential Tuition. Course Fee: GS01 \$90.

### ES 5163. Urban Wildlife Ecology. (3-0) 3 Credit Hours.

Fundamentals of urban ecology, field methods including urban wildlife and human surveys, and urban wildlife management and conservation strategies. Generally offered: Fall of even years. This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 5173. Fundamental of Environmental Risk Assessment. (3-0) 3 Credit Hours.**

This course will offer hands-on training in the primary areas of risk assessment (e.g., hazard identification, dose-response assessment, exposure assessment, and risk characterization). Generally offered: Fall of odd years. This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 5183. Advanced Environmental Risk Assessment. (3-0) 3 Credit Hours.**

This course will offer hands-on training in the advanced areas of risk assessment (e.g., hazard identification, dose-response assessment, exposure assessment, and risk characterization). Generally offered: Spring of even years. This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 5213. Environmental Geology. (3-0) 3 Credit Hours.**

Prerequisite: GEO 4063 or consent of instructor. Geologic materials and processes as related to their influence on the human physical environment. Effects of landscape modification and geologic hazards such as earthquakes and landslides. Properties of minerals, rocks, and soils and geologic aspects of waste disposal and water resources are examined. Course cannot be used for graduate credit by students in Geology. (Formerly EES 5213. Credit cannot be earned for both EES 5213 and ES 5213.) This course has Differential Tuition. Course Fee: GS01 \$90; LRS1 \$46.20; STSI \$21.60.

**ES 5233. Experimental Design and Analysis. (3-0) 3 Credit Hours.**

Prerequisite: ES 5023 or an equivalent, or consent of instructor. Fundamental concepts of the statistical design and analysis of environmental experiments will be presented. Students will be required to design experiments and to analyze data using computer software. (Formerly EES 5233. Credit cannot be earned for both EES 5233 and ES 5233.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 5243. Advanced Plant Ecology. (3-0) 3 Credit Hours.**

Prerequisite: BIO 3283 and BIO 3292, or consent of instructor. A study of the major biomes of the world, including North America and Texas, and the factors that influence the development of these biomes. Special consideration is given to species interactions that lead to high and low density species. (Formerly EES 5243. Same as BIO 5243. Credit can be earned for only one of the following: BIO 5243, EES 5243, or ES 5243.) This course has Differential Tuition. Course Fee: GS01 \$90; LRS1 \$46.20; STSI \$21.60.

**ES 5413. Environmental Toxicology. (3-0) 3 Credit Hours.**

This course will focus on the molecular mechanisms by which toxic compounds in the environment affect animal and plant biological systems. Risk Assessment procedures will provide the scientific context to quantify and evaluate the environmental impact of hazards associated with toxins, including heavy metals, pesticides, and plasticizers, on human health. The potential risk associated with exposure to endocrine disruptors and carcinogens will also be considered. (Same as BIO 5553. Credit cannot be earned for both ES 5413 and BIO 5553.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 5493. Water Pollution Control. (3-0) 3 Credit Hours.**

Principles and methods of water pollution control process design and operation; selection and optimization of total treatment processes as well as appurtenances and accessory equipments; and methods involved in the design process and the selection of the hardware. (Formerly EES 5493. Credit cannot be earned for both EES 5493 and ES 5493.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 5503. Policy and Principles of Environmental Law. (3-0) 3 Credit Hours.**

Prerequisite: ES 3203 or ES 5133, or equivalent. This course exposes students to advanced policies and principles relevant to contemporary environmental practice, and provides advanced knowledge of the six federal environmental statutes: the Clean Air Act, Clean Water Act, National Environmental Policy Act, Endangered Species Act, Resource Conservation and Recovery Act, and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). (Formerly PAD 5483 and EES 5503. Credit can be earned for only one of the following: EES 5503, ES 5503, or PAD 5483.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 5513. Aquatic Ecology. (3-0) 3 Credit Hours.**

Study of aquatic ecosystems including streams, wetlands, and lakes. Topics include watershed processes, biological communities, physical habitats, nutrient cycling, energy flow, and management issues. The course culminates with individual research projects focused on local watersheds. Field trips may be required. (Same as BIO 5383, BIO 4303, ES 4023. Credit may only be earned for one of the following: BIO 5383, BIO 4303, ES 4023, and ES 5513.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 5523. Watershed Processes. (3-0) 3 Credit Hours.**

This course focuses on watershed processes, watershed assessment, and watershed management. (Same as ES 3143. Credit cannot be earned for both ES 3143 and ES 5523.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 5533. Planning and Response to Environmental Disasters. (3-0) 3 Credit Hours.**

This course will focus on planning, response and recovery from large, complex environmental disasters and the roles and implications for Response Managers and Environmental Scientists. (Same as ES 4193. Credit cannot be earned for both ES 4193 and ES 5533.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 5743. Ichthyology. (3-0) 3 Credit Hours.**

Study of fishes, and includes a wide range of topics including taxonomy, systematics, and biogeography, anatomy and physiology, and behavior and ecology. This course will focus on form and function, behavior, life history, ecology, and key taxonomic characteristics of most of the orders of fishes. Field trips may be required. (Same as BIO 5763 and ES 3113. Credit can only be earned for one of the following: ES 5743, BIO 5763, and ES 3113.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 5753. Conservation Ecology. (3-0) 3 Credit Hours.**

Prerequisite: Graduate Standing. The class topics will include the nature of the biosphere, threats to its integrity, and ecologically sound responses to these threats. Also included will be the origin and preservation of biotic diversity, how the rich variety of plant and animal life arose, how it has been maintained by natural processes, and how its destruction can be prevented. (Same as BIO 5753. Credit cannot be earned for both BIO 5753 and ES 5753.) This course has Differential Tuition. Course Fee: GS01 \$90; LRS1 \$46.20; STSI \$21.60.

**ES 5763. Ornithology. (3-0) 3 Credit Hours.**

A course covering various aspects of the biology of birds, including anatomy, physiology, systematics, evolution, behavior, ecology, and biogeography. Field trips may be included. (Same as BIO 5713. Credit cannot be earned for both BIO 5713 and ES 5763.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 5773. Wildlife Ecology. (3-0) 3 Credit Hours.**

Prerequisite: Graduate Standing. This course covers major environmental factors affecting wildlife, the structure and behavior of wildlife populations, and regional wildlife communities and their conservation. Field studies will allow students to observe and apply classroom topics. (Formerly BIO 5793. Same as BIO 5843. Credit can only be earned for one of the following: ES 5773, BIO 5793, or BIO 5843.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 5863. Wildlife Management. (3-0) 3 Credit Hours.**

Prerequisite: Graduate Standing. This course covers ways of conserving desired numbers of animals for the overall best interests of society, be they aesthetic, ecological, economic, commercial, or recreational. This course includes management of endangered species, exploited species, wildlife communities in nature reserves, and wildlife pests. (Same as BIO 5793. Credit cannot be earned for both BIO 5793 and ES 5863.) Generally offered: Spring of even years. This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 5971. Directed Research. (0-0) 1 Credit Hour.**

Prerequisite: Graduate standing and permission in writing (form available) from the instructor and the student's Graduate Advisor of Record.

The directed research course may involve a laboratory, field-based, or theoretical problem. May be repeated for credit, but not more than 3 hours, regardless of discipline, will apply to the Master's degree. (Formerly EES 5971-3.) This course has Differential Tuition. Course Fee: GS01 \$30.

**ES 5973. Directed Research. (0-0) 3 Credit Hours.**

Prerequisite: Graduate standing and permission in writing (form available) from the instructor and the student's Graduate Advisor of Record.

The directed research course may involve a laboratory, field-based, or theoretical problem. May be repeated for credit, but not more than 3 hours, regardless of discipline, will apply to the Master's degree. (Formerly EES 5971-3.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 5981. Graduate Seminar in Environmental Science and Engineering. (1-0) 1 Credit Hour.**

Prerequisite: Graduate standing in the program or consent of instructor. Topical issues of current research will be examined. Presentations will be by current faculty, invited guests and Master's or Doctoral candidates. May be repeated for credit but only 2 hours may be applied toward the Master's degree. The grade report for this course is either "CR" (satisfactory) or "NC" (unsatisfactory). (Formerly EES 5981 and ES 5991. Same as CE 6621.) This course has Differential Tuition. Course Fee: GS01 \$30.

**ES 6013. R Coding in Environmental Science and Ecology. (3-0) 3 Credit Hours.**

This course will teach the management of environmental and ecological data using Program R. The focus will be on the structure and linguistics of data in R and how to integrate R in a data science workflow. (Same as ES 5013. Credit cannot be earned for both ES 5013 and ES 6013.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 6023. Plant Ecophysiology. (3-0) 3 Credit Hours.**

A survey of physiological approaches to understanding plant-environment interactions from the functional perspective. Lectures cover physiological adaptation; limiting factors; resources acquisition/ allocation; photosynthesis, carbon, energy balance; water use relations nutrient relations; linking ecophysiology and stable isotopes; stress physiology; life history physiology; evolution of physiological performance; ecophysiology at the population, community, ecosystem levels. This course has Differential Tuition. Course Fee: GS01 \$90; LRS1 \$46.20; STSI \$21.60.

**ES 6033. Applied Multivariate Statistics for Ecological Data. (3-0) 3 Credit Hours.**

Prerequisite: ES 5023. This course provides students with a conceptual and practical understanding of the application of multivariate statistics in environmental science and ecology. Course will include analysis such as classification (creating discrete groups) and dimension reduction, as well as visualization techniques such as ordination. Applications include habitat classification, clustering (i.e., community classification), and exploring community-environment relationships. This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 6053. Sustainability and Renewable Energy. (3-0) 3 Credit Hours.**

Prerequisite: Graduate standing. This course provides an introduction to energy systems and renewable energy resources. It will be a scientific examination of the energy field and an emphasis on alternate energy sources, their technology, application, and how they can lead to a more sustainable future. The class will explore society's present needs and future energy demands, examine conventional energy sources and systems, and then focus on alternate, renewable energy sources and how they can lead to sustainability. This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 6063. Human Dimensions of Wildlife. (3-0) 3 Credit Hours.**

This course will focus on the human dimensions of wildlife and will introduce students to how people's knowledge, values, opinions, and behaviors influence wildlife management. We will explore the ways that economics, politics, culture, and society shape wildlife management decisions and we will learn about conservation strategies that consider human dimensions. This course will have an emphasis on the human dimensions of wildlife management and conservation on private lands in Texas. This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 6103. Environmental Assessment. (3-0) 3 Credit Hours.**

Prerequisite: Graduate standing. This course evaluates the framework of an impact assessment and details regarding the environment (air, water, soil), its pollutants (atmospheric, noise, water, solid waste), their impacts (physical, social, economic), relevant regulations, and pollution minimization or management strategies. Students will use this information to prepare a hypothetical Environmental Impact Statement (EIS). (Formerly EES 6103 and ES 5203. Credit can be earned for only one of the following: EES 6103, ES 5203, or ES 6103.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 6133. Methods in Field Ecology. (3-0) 3 Credit Hours.**

Prerequisite: BIO 3283 or an equivalent. Examination of techniques to collect, identify, and preserve plants and animals. Field methods used in the analysis of populations and communities are considered. (Formerly EES 6133. Same as BIO 6133. Credit can be earned for only one of the following: BIO 6133, EES 6133, or ES 6133.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 6213. Advanced Ecology. (3-0) 3 Credit Hours.**

Prerequisite: BIO 3283 or an equivalent. Interaction of organisms with their environment, allelopathy, competition, distribution, succession, and factors that control growth and dispersal. Special consideration is given to the concepts of climax, succession, and land management. (Formerly EES 6213. Same as BIO 6213. Credit can be earned for only one of the following: BIO 6213, EES 6213, or ES 6213.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 6273. Analyses of Environmental Problems. (3-0) 3 Credit Hours.**

Problems will be presented and potential solutions will be explored from a variety of areas including soil, air, water, coastal and marine systems. Also examined will be potential impact on biotic and abiotic resources in terrestrial, aquatic and marine systems. (Formerly EES 6273 and CE 6273. Credit can be earned for only one of the following: CE 6273, EES 6273, or ES 6273.) This course has Differential Tuition. Course Fee: GS01 \$90; LRS1 \$46.20; STSI \$21.60.

**ES 6723. Application of Federal Environmental Law at the State Level. (3-0) 3 Credit Hours.**

Prerequisite: ES 5503. This course exposes students the application of federal laws at the State level. The course will provide information on how environmental laws should be enforced, and whether the state or federal government should have the final word in specific environmental debates. (Formerly EES 6723 and CE 6723. Credit can be earned for only one of the following: CE 6723, EES 6723, or ES 6723.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 6813. Water Resources. (3-0) 3 Credit Hours.**

Application of management principles to the efficient use of water resources by people and their public and private institutions. Water is examined in terms of its value, use, and changing role in the context of economics, history, politics, and technology. (Formerly EES 6813. Same as GEO 6813. Credit can be earned for only one of the following: EES 6813, ES 6813, or GEO 6813.) This course has Differential Tuition. Course Fee: GS01 \$90; LRS1 \$46.20; STSI \$21.60.

**ES 6901. Experimental Techniques in the Environmental Sciences. (0-3) 1 Credit Hour.**

Prerequisite: Consent of instructor. Course topics will include various research methods in environmental science. May be repeated for credit as topics vary. (Formerly EES 6901, EES 6902, and EES 6903. Same as ES 6902 and ES 6903. Unless topic varies, credit may only be earned for one of the following: EES 6901, EES 6902, EES 5903, ES 6902, ES 6903, and ES 6901.) This course has Differential Tuition. Course Fee: GS01 \$30; LRS1 \$15.40; STSI \$7.20.

**ES 6902. Experimental Techniques in the Environmental Sciences. (0-6) 2 Credit Hours.**

Prerequisite: Consent of instructor. Course topics will include various research methods in environmental science. May be repeated for credit as topics vary. (Formerly EES 6901, EES 6902, and EES 6903. Same as ES 6901 and ES 6903. Unless topic varies, credit may only be earned for one of the following: EES 6901, EES 6902, EES 5903, ES 6901, ES 6903, and ES 6902.) This course has Differential Tuition. Course Fee: GS01 \$60; LRS1 \$30.80; STSI \$14.40.

**ES 6903. Experimental Techniques in the Environmental Sciences. (0-9) 3 Credit Hours.**

Prerequisite: Consent of instructor. Course topics will include various research methods in environmental science. May be repeated for credit as topics vary. (Formerly EES 6901, EES 6902, and EES 6903. Same as ES 6901 and ES 6902. Unless topic varies, credit may only be earned for one of the following: EES 6901, EES 6902, EES 6903, ES 6901, ES 6902, and ES 6903.) This course has Differential Tuition. Course Fee: GS01 \$90; LRS1 \$46.20; STSI \$21.60.

**ES 6941. Environmental Science Colloquium. (1-0) 1 Credit Hour.**

Prerequisite: Graduate standing. Discussions of current journal articles, reviews, and recent advances in specialized areas of the biological sciences. May be repeated for credit as topics vary. The grade report for this course is either "CR" (satisfactory participation in the colloquium) or "NC" (unsatisfactory participation in the colloquium). (Formerly EES 6941. Same as BIO 7041 and BIO 6941. Unless topic varies, credit can be earned for only one of the following: BIO 7041, EES 6941, or ES 6941.) This course has Differential Tuition. Course Fee: GS01 \$30.

**ES 6951. Independent Study. (0-0) 1 Credit Hour.**

Prerequisite: Graduate standing and permission in writing (form available) from the instructor and the student's Graduate Advisor of Record. Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master's degree. (Formerly EES 6951-3.) This course has Differential Tuition. Course Fee: GS01 \$30.

**ES 6953. Independent Study. (0-0) 3 Credit Hours.**

Prerequisite: Graduate standing and permission in writing (form available) from the instructor and the student's Graduate Advisor of Record. Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master's degree. (Formerly EES 6951-3.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 6961. Comprehensive Examination. (0-0) 1 Credit Hour.**

Prerequisite: Approval of the appropriate Graduate Program Committee to take the Comprehensive Examination. Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either "CR" (satisfactory performance on the Comprehensive Examination) or "NC" (unsatisfactory performance on the Comprehensive Examination). (Formerly EES 6961.) This course has Differential Tuition. Course Fee: GS01 \$30.

**ES 6963. Internship. (0-0) 3 Credit Hours.**

Prerequisite: Graduate standing and consent of Graduate Advisor of Record. An opportunity for students to work in a setting that permits them to apply what they have learned in the formal instruction part of the program. May be repeated for credit, but not more than 3 hours will apply to the Master's degree. (Formerly EES 6963. Credit cannot be earned for both EES 6963 and ES 6963.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 6973. Special Problems. (3-0) 3 Credit Hours.**

Prerequisite: Consent of instructor. An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but not more than 6 hours, regardless of discipline, will apply to a Master's degree. Field trips may be required. (Formerly EES 6973.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 6981. Master's Thesis. (0-0) 1 Credit Hour.**

Prerequisite: Permission of the Graduate Advisor of Record and thesis director. Thesis research preparation. May be repeated for credit, but not more than 6 hours will apply to the Master's degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress. This course has Differential Tuition. Course Fee: GS01 \$30.

**ES 6983. Master's Thesis. (0-0) 3 Credit Hours.**

Prerequisite: Permission of the Graduate Advisor of Record and thesis director. Thesis research preparation. May be repeated for credit, but not more than 6 hours will apply to the Master's degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress. (Formerly EES 6983.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 7211. Doctoral Research. (0-0) 1 Credit Hour.**

Prerequisite: Admission to candidacy for the Doctoral degree. May be repeated for credit, but no more than 15 hours may be applied to the Doctoral degree. (Formerly EES 7211-3.) This course has Differential Tuition. Course Fees: GS01 \$30.

**ES 7212. Doctoral Research. (0-0) 2 Credit Hours.**

Prerequisite: Admission to candidacy for the Doctoral degree. May be repeated for credit, but no more than 15 hours may be applied to the Doctoral degree. (Formerly EES 7211-3.) This course has Differential Tuition. Course Fee: GS01 \$60.

**ES 7213. Doctoral Research. (0-0) 3 Credit Hours.**

Prerequisite: Admission to candidacy for the Doctoral degree. May be repeated for credit, but no more than 15 hours may be applied to the Doctoral degree. (Formerly EES 7211-3. Same as CE 7213.) This course has Differential Tuition. Course Fee: GS01 \$90.

**ES 7311. Doctoral Dissertation. (0-0) 1 Credit Hour.**

Prerequisite: Admission to candidacy for the Doctoral degree. May be repeated for credit, but no more than 15 hours may be applied to the Doctoral degree. (Formerly EES 7311-3.) This course has Differential Tuition. Course Fee: GS01 \$30.

**ES 7312. Doctoral Dissertation. (0-0) 2 Credit Hours.**

Prerequisite: Admission to candidacy for the Doctoral degree. May be repeated for credit, but no more than 15 hours may be applied to the Doctoral degree. (Formerly EES 7311-3.) This course has Differential Tuition. Course Fee: GS01 \$60.

**ES 7313. Doctoral Dissertation. (0-0) 3 Credit Hours.**

Prerequisite: Admission to candidacy for the Doctoral degree. May be repeated for credit, but no more than 15 hours may be applied to the Doctoral degree. (Formerly EES 7311-3.) This course has Differential Tuition. Course Fee: GS01 \$90.